This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

ARCHIVES

OF

OTOLOGY

EDITED IN ENGLISH AND GERMAN

BY

DR. H. KNAPP
OF NEW YORK

DR. O. KÖRNER
OF ROSTOCK

DR. A. HARTMANN AND DR. U. PRITCHARD
OF BERLIN OF LONDON

VOLUME XXX

NEW YORK
G. P. PUTNAM'S SONS, 27 & 29 WEST 23D STREET
AND NEW ROCHELLE, N. Y.
LONDON: 24 BEDFORD STREET, STRAND
WIESBADEN: J. F. BERGMANN'S Verlag
PARIS: J.-B. BAILLIÈRE, 19 Rue Hautefeuille
1901

BOSTON MEDICAL
FEB 6 1903
LIBRARY.

The Knickerbocker Press, New York

CATALOGUED
FEB 6 1903
E. H. B.

CONTENTS OF VOLUME XXX.

NUMBER I.

PAGE

1. On the Healing of Cerebral Abscesses. By Prof. **Passow,** Heidelberg. Translated by Dr. RICH. JORDAN, New York. (With two illustrations on Plate I. of Vol. XXXVII. of German Edition) 1

2. Non-Operative Cases of Acute Inflammation of the Mastoid Cells. By **Gorham Bacon,** M.D., New York 7

3. Annual Report of the Ear and Throat Departments of the City Hospital in Basel from January 1, 1898, to January 1, 1899. By Dr. **E. Sporleder.** Abridged and Translated by Dr. O. JOACHIM, New Orleans 15

4. Otitic Abscess of the Temporal Lobe. By Dr. **Herman Preysing,** Breslau. Translated by Dr. O. JOACHIM, New Orleans . 25

5. Three Cases Operated upon for Otitic Abscess of the Temporal Lobe, with Fatal Result. By Dr. **F. Röpke,** of Solingen. Translated and Abridged by Dr. EDWIN M. COX, New York . 30

6. Report of the Meeting of the New York Otological Society of November 27, 1900. By **H. A. Alderton,** M.D., Secretary . 36

7. Report of the Section on Otology at the New York Academy of Medicine. Stated meeting, held December 12, 1900. By **Dr. R. C. Myles,** Secretary 45

8. Report on the Progress in Otology for the Second Quarter of 1900. By Dr. **A. Hartmann.** Translated by Dr. ARNOLD KNAPP. (*Concluded from Vol. XXIX., p. 485*) 57

NUMBER 2.

1. Electrolysis in the Destruction of Organized Strictures of the Eustachian Tube. By **Joseph A. Kenefick,** M.D. 73

2. Acute Otitis Media, Cerebellar Abscess; Operation; Death from Meningitis. By **Wendell C. Phillips,** M.D. 85

PAGE

3. Mastoiditis Complicated by Paralysis of External Rectus. By Dr. **Kaspar Pischel,** San Francisco, Cal. 91

4. Acute Mastoiditis, Thrombosis of Lateral Sinus, Perforation into Pharynx. By Dr. **Kaspar Pischel,** San Francisco, Cal. . . 93

5. Skin Flap for Immediate Closing of Wound in the Radical Mastoid Operation. By Dr. **Kaspar Pischel,** San Francisco, Cal. (With an illustration in text) 95

6. The Diagnosis and Treatment of Otitic Meningitis. By Dr. **Hinsberg,** of Breslau. Translated and Abridged by Dr. Edwin M. Cox, of New York 96

7. Primary Otitis Externa from a Clinical Point of View. By Dr. **C. J. M. Schmidt,** Odessa. Translated by Dr. C. Mund, New York 113

8. Topographic Anatomy and Operative Technique of Otitic Abscess of the Temporal Lobe. By Dr. **H. Preysing,** Leipzig. Translated and Abridged by Dr. O. Joachim, New Orleans. (With three illustrations on Plates V.-VII. of Vol. XXXVII. of German Edition) 127

9. The Otological Society of the United Kingdom, Meeting December 3, 1900 132

10. The New York Otological Society. Report of the Meeting of January 22, 1901. By Dr. **H. A. Alderton,** Secretary . . 136

11. The Section on Otology of the New York Academy of Medicine. Report of the Meeting, January 9, 1901. By Dr. **R. C. Myles,** Secretary 140
    Report of the Meeting, February 13, 1901. By Dr. **J. A. Kenefick,** Acting Secretary 156

12. Report on the Progress in Otology for the Third Quarter of 1900. By Dr. **A. Hartmann.** Translated by Dr. Arnold Knapp . 164

13. Book Reviews 177
    I.—Rhinology, Laryngology, and Otology, and their Significance in General Medicine. By Dr. E. P. Friedrich, of Leipzig.
    II.—The Year-Book of the Nose, Throat, and Ear. Edited by Dr. G. P. Head and Dr. A. H. Andrews.

14. Miscellaneous Notes 178

NUMBER 3.

1. A Case of Cerebellar Abscess. Operation. Recovery. By **W. G. Richards,** M.B., F.R.C.S. (With a temperature chart) . 179

2. Functional Significance of the Round Window. By Dr. **A. Frutiger,** of Basel. Translated and Abridged by Dr. J. A. Spalding, Portland, Me. 181

PAGE

3. Carcinoma of the Ear. By Dr. **Leopold Treitel,** M.D., Berlin. Translated by ADOLPH O. PFINGST, M.D., Louisville, Ky. . 189

4. Adenoid Operation on the Pendent Head under General Anæsthesia. By Dr. **P. Rudloff,** Wiesbaden. Translated and Abridged by Dr. C. MUND, New York 199

5. Tympanic Vertigo Due to Obstruction within the Eustachian Tube. By Dr. **Wm. P. Brandegee,** New York 205

6. A Correlation of One Hundred Successive Mastoid Operations. By **Edwin W. Pyle,** M.D., Jersey City 214

7. Empyema of the Right Maxillary, Ethmoidal, and Sphenoidal Sinuses with Sudden Blindness of the Left Eye. Operation. Recovery of Sight. By **T. H. Halsted,** M.D., Syracuse, N. Y. 222

8. A Case of Tuberculosis of the Ear, with Autopsy. By **Henry L. Swain,** M.D., New Haven, Conn. 230

9. Report of the Meeting of the New York Otological Society of March 26, 1901. By Dr. **H. A. Alderton,** Secretary . . 235

10. Report on the Transactions of the Section on Otology, at the New York Academy of Medicine, Meetings of March 13 and April 10, 1901 243

11. Report on the Transactions of the Otological Society of the United Kingdom, Meeting of March 4, 1901. By Mr. **A. H. Cheatle** . 262

12. Report on the Progress in Otology during the Third Quarter of 1900. By Dr. **Arthur Hartmann.** Translated by Dr. ARNOLD KNAPP 264

13. Book Notice 277
    III.—Lehrbuch der Ohrenheilkunde für Aerzte u. Studirende. By A. Politzer Fourth Edition.

14. Appointments — Körner, Urbantschitsch, Kümmel . . . 282

NUMBERS 4 AND 5.

1. On the Therapeutic Value of Vibratory Massage of the Drumhead. By Dr. **Schwabach,** of Berlin. Abridged and Translated by Dr. H. KNAPP 283

2. On Otogenous Meningitis. By Dr. **Jacob Cohn,** of Breslau. Translated by Dr. H. KNAPP 291

3. Retropharyngeal Abscesses after Otitis Media Purulenta. By Dr. **George Kien,** Strassburg. Translated and Abridged by Dr. J. A. SPALDING, Portland, Me. 304

PAGE

4. Thrombo-Phlebitis of the Superior Longitudinal Sinus Following Inflammation of the Frontal Sinus. By Prof. **G. Killian,** Freiburg i. Br. Translated by Dr. ARNOLD KNAPP, New York. (With six illustrations on Plates VIII. and IX., *Zeitschrift für Ohrenheilkunde*, Vol. XXXVII.) 314

5. A True Cholesteatoma in the Posterior Cranial Fossa—Infected by Middle-Ear Suppuration—Operation—Recovery. By Dr. **O. Körner,** of Rostock. Translated and Abridged by Dr. EDWIN M. COX, of New York 323

6. A Case of Pyæmia Caused by Bilateral Otitis Media with Osteo-Phlebitis of the Temporal Bone. By Dr. **E. Rimini,** of Triest. Translated and Abridged by Dr. EDWIN M. COX, of New York. 326

7. Two Cases of Brain Abscess—Operation—Recovery. By Dr. **P. Manasse,** Strassburg. Abridged Translation by Dr. ARNOLD KNAPP, New York 328

8. The Technique of Intranasal Operations. By Dr. **Alfred Denker,** of Hagen. Translated and Abridged by Dr. EDWIN M. COX, of New York 332

9. The Histology of Aural Polypi. By Dr. **G. Brühl,** Berlin. Translated by Dr. ARNOLD KNAPP, New York 334

10. Operations on the Mastoid in Constitutional Disease. By Dr. **Ernst Barth,** Brieg, near Breslau, Germany. Translated by Dr. ADOLPH O. PFINGST, Louisville, Ky. 344

11. Eye Disease in Relation to Tuberculosis of the Nasal Mucous Membrane, and the Treatment of the Latter by Means of Lactic Acid. By Dr. **V. Hinsberg,** Breslau. Translated by Dr. CARL MUND, New York 352

12. Report of the Tenth Meeting of the German Otological Society, Held in Breslau, May 24-25, 1901. By Dr. **Max Goercke,** Breslau. Translated by Dr. RICHARD JORDAN, New York . 363

13. Report of the Section on Otology of the New York Academy of Medicine. Stated Meeting held May 8, 1901. By Dr. **R. C. Myles,** Secretary 390

14. Report on the Progress in Otology during the Fourth Quarter of the Year 1900 and during the First Quarter of the Year 1901. By Dr. **A. Hartmann.** Translated by Dr. ARNOLD KNAPP, New York, 398

15. Book Notices 452
    IV.—Transactions of the Otological Society of the United Kingdom. Edited by Charles A. Ballance, M.S., F.R.C.S., and Arthur H. Cheatle, F.R.C.S.
    V.—Oreille et Hystérie. By Dr. Fleury-Chavanne.

NUMBER 6.

PAGE

1. A Tumor of the Middle Ear Springing from the Inner and Posterior Tympanic Walls, Simulating Exostosis but Consisting of Calcareous Laminæ. By **William C. Braislin, M.D.** (With two microphotographs on Text-plate II.) 463

2. The Microscope as an Aid to Diagnosis and Prognosis in Chronic Suppurations of the Middle Ear. By **E. F. Snydacker,** M.D., Chicago. (With two text-illustrations) 466

3. A Case of Meningitis from Extension of Acute Purulent Otitis Media through Osteomyelitis of the Petrous Bone. Operation. Autopsy. Microscopic Examination. By Dr. **Arnold Knapp** . . . 474

4. Contribution on Otogenous Disease of the Brain, Meninges, and Venous Sinuses. By Dr. **Witte** and Dr. **Sturm,** Rostock. Translated and Abridged by Dr. EDWIN M. COX, New York . 482

5. Report on the Meeting of the New York Otological Society of May 28, 1901. By **H. A. Alderton,** M.D., Secretary . . . 491

6. Report of the Section on Otology, of the New York Academy of Medicine. By Dr. **Robert C. Myles,** Secretary . . . 500

7. Report on the Progress of Otology during the Second Quarter of the Year 1901. By Dr. **A. Hartmann.** Translated by Dr. ARNOLD KNAPP 518

8. Book Notices 550
    - VI.—The Accessory Sinuses of the Nose, their Surgical Anatomy, and the Diagnosis and Treatment of their Inflammatory Affections. By A. Logan Turner, M.D.
    - VII.—Manual of the Diseases of the Ear. By Thomas Barr, M.D.
    - VIII.—Diseases of the Nose and Throat. By F. de H. Hall and H. Tilley.
    - IX.—International Directory of Laryngologists and Otologists. Compiled by Richard Lake.
    - X.—Surgical Anatomy and Operative Surgery of the Middle Ear. By A. Broca.
    - XI.—A Treatise on the Diseases of the Ear, Including the Anatomy and Physiology of the Organ, together with the Treatment of the Affections of the Nose and Pharynx which Conduce to Aural Disease. By T. Mark Hovell, F.R.C.S.

9. Obituary. 554
    - Hermann Steinbrügge.
    - Friedrich Semeleder.
    - Adolf Fick.

10. Miscellaneous Notes 555
    - Appointments: Hansberg, Leutert, Hegner, Hinsberg.
    - Announcement: The VIIth International Otological Congress postponed.

11. Index to Authors and Subjects of Vol. XXX. 557

EDITORIAL NOTICE.

The ARCHIVES OF OTOLOGY is a bi-monthly journal, published in annual volumes of about five hundred pages each, extensively illustrated with cuts in the text, half-tone text plates, and lithographic plates, many in colors.

About three quarters of the space is devoted to original papers, and the remaining quarter to a systematic report on the progress of otology, and to reports of societies, book reviews, and miscellaneous notes.

The papers and reports are original, and only accepted with the understanding that they are to be published in this journal exclusively. The original papers in the English edition appear in the German (*Archiv für Ohrenheilkunde*) either in full or in more or less abridged translations, and *vice versa*.

Any subscriber that wishes to refer to the original text of a translated or abridged paper may, by applying to the editor, obtain a reprint which, it is expected, he will return after perusal.

Original papers of value from any source are solicited.

Communications for the English edition of the ARCHIVES OF OTOLOGY should be addressed to DR. H. KNAPP, 26 West 40th Street, New York, or to DR. U. PRITCHARD, 26 Wimpole Street, W., London, England.

The subscription price of the ARCHIVES OF OTOLOGY is $4.00 per year, payable in advance. The price per number is 75 cents.

The ARCHIVES is sent postage free in the United States, Canada, and Mexico.

the centre of his wounds consisted of connective-tissue fibres, the surrounding tissue of neuroglia with nerve cells, which could hardly be recognized as such. Tedeschi says: "The nervous elements of the cicatrix are different in size, form, and position from those normally found in the same locality." The cicatrix proper in our case, which is about one third the size of the original abscess, extends into the cerebrum for not quite 1 *cm*, but, as mentioned before, the surrounding brain-substance also shows pathological changes.

The formation of the cerebral abscess was aided by the extreme thinness of the tegmen tympani, which was defective even on the healthy side.

It is an interesting question if the suicide was brought about by the ear disease. There was no history of mental disease in the patient's family. He had always been in good health; he was not a drinking man. His financial and family affairs gave him no cause for anxiety.

The ear disease, the seriousness of which he only realized when he consented to the operation, aroused melancholy ideas in him, and when he suffered a relapse of his otitis, although again and again assured that there was no cause for worry, he could not free himself of the idea that he had fallen a victim to a serious brain-disease which would ultimately lead to insanity. It was not likely that in our case, as in Pluder's,[1] the mastoid operation had produced the psychical disturbance—for such it was; we would rather attribute it to the patient's dread of a prolonged illness and a second operation. The insignificant cicatrix in the cerebrum cannot have caused the mental disturbance.

---

[1] Pluder, "Psychical Disturbances Following Mastoid Operations," *Arch. f. Ohr.*, Bd. xlvi., S. 101.

Figure 1.

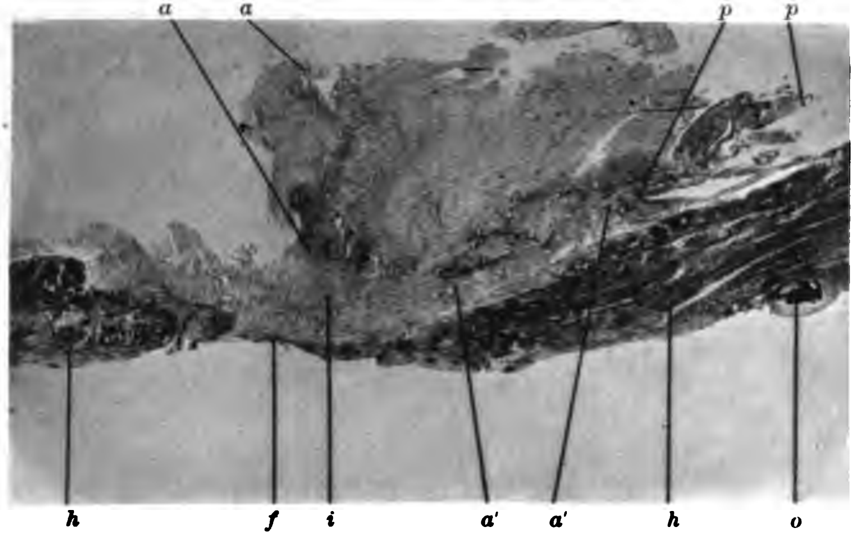
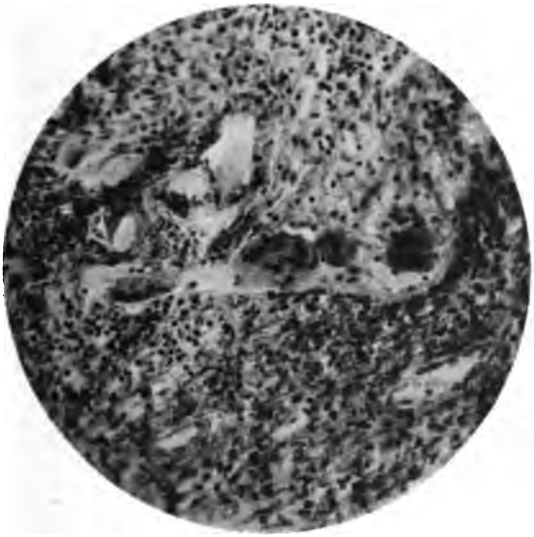


Figure 2.



NON-OPERATIVE CASES OF ACUTE INFLAMMATION OF THE MASTOID CELLS.[1]

By GORHAM BACON, M.D., New York,

PROFESSOR OF OTOLOGY, CORNELL UNIVERSITY MEDICAL COLLEGE.

Mr. President and Gentlemen :

Having occasionally been asked by the general practitioner of medicine as to whether the otologist does not operate on every case of mastoid disease which comes under his observation, it seemed to me that this might be a favorable opportunity to answer the question. In the statistics which I propose to give this evening, I have taken the histories of private patients as they came in regular order in my case-books. I have purposely chosen the latter class of cases because they were under my observation for a sufficient length of time to know that there have been no instances of either relapse or of subsequent operation on the mastoid cells.

Of 40 cases of acute purulent otitis media complicated by acute inflammation of the mastoid cells, it was necessary to do a radical mastoid operation in 10 instances. In 2 of these 10 operations a subsequent operation for sinus thrombosis was performed. Of these 2 latter cases, viz., of sinus thrombosis, 1 terminated fatally. This was the only case of death in these 40 cases. *In 30 cases, or 75 per cent., the mastoid cells were not opened.* Of these 40 patients the ages varied from six to sixty-five years. There were 20 children under fifteen years of age. Of these 20 children 16 were males and 4 females. Of the remaining 20 adults, 10 were males and 10 females.

---

[1] Read at the Meeting of the Section on Otology, N. Y. Academy of Medicine, Dec. 12, 1900.

As the time is somewhat limited this evening, and as the histories of the cases are very much alike, the treatment being practically the same in almost every instance, I have selected but fourteen (14) cases, the records of which I submit for your consideration.

CASE 1. — Mr. C——, aged fifty, had recently had an attack of influenza. Five days ago he had an earache in left ear following a sore throat and acute coryza. When seen in consultation there was marked tenderness on pressure at the tip and over the lower third of the mastoid process. There was a sero-sanguinolent discharge from the left ear and a perforation in the anterior lower quadrant of the drumhead. A free incision was made in the posterior upper and lower quadrants along the posterior border of the membrane. The Leiter coil was applied. The patient was given three doses of calomel in ½-grain tablets, followed by Hunjadi. The patient's condition gradually improved, the discharge became more copious. The temp. ranged from 99½° to 100½° F. The membrane had to be incised again. The patient made an excellent recovery without a mastoid operation.

CASE 2.—V——, six years of age, had measles a short time ago, and within a few days he had an earache on right side. To-day temp. 104° F. Seen in consultation for first time to-day. Patient very deaf; drumheads congested and bulging; marked tenderness over both mastoid processes, especially over the antrum and tip. Leiter coils applied, and on the following day both drumheads were freely incised. The temp. fell to 100° F. very soon after the incision. Leiter coils kept on. The ears discharged for some time. The incisions healed nicely and the hearing became normal.

CASE 3. — Miss J——, thirty-two years of age, had acute otitis media following grippe. Right ear affected; sudden pain; artificial leech used and drumhead incised. Leiter coil applied and left on for forty-eight hours. Pain relieved and patient made a good recovery.

CASE 4.—A little girl, aged six years, was seen in consultation. Three days previously she had pain in right ear as a result of tonsillitis. Ear ruptured spontaneously and was followed by a bloody serous discharge. Temp. 103½° F. Child developed scarlet fever. Both mastoid processes very tender, and both drumheads freely incised as they were bulging. Leiter coils applied. Patient made an excellent recovery.

CASE 5. — Patient, fifty years old, had an attack of acute purulent otitis media with involvement of the mastoid cells. As the opening in the drumhead was small, a free incision was made in the posterior and upper portion. Later there was some œdema over the mastoid, and the question of opening the cells was seriously considered. Another attempt to drain the ear was made by a free incision in the drumhead. The patient recovered without further operative measures.

CASE 6.—Miss C., twenty years of age, had an earache a week ago, followed by a discharge from the right ear. There was considerable pain, and the mastoid was probably involved from the start. I saw the patient in consultation, and made a free opening in the drumhead, and applied the Leiter coil. The patient was under my immediate care for the next four days. The tenderness over the mastoid gradually disappeared, and the patient recovered under the treatment as given, except that in addition the ear was frequently douched with either a bichloride or a boracic-acid solution.

CASE 7.—Boy, twelve years old, gave a history of pain for four days in ear. Both ears affected in consequence of an attack of grippe. Patient dull and listless. Tenderness over both mastoid processes, especially over each antrum. Drumheads bulging and congested. Temperature 101⅘° F. Under chloroform both drumheads were incised. Ice-bags were applied, and the ears were ordered to be frequently douched. On the following day the temperature was 99⅗° F., and there was a copious discharge from the ears. Boy made a good recovery.

CASE 8.—Patient, four years old, had an attack of influenza six weeks ago. Three days ago had pain in left ear. He was better the next day, and the temperature was normal. To-day I saw him in consultation owing to the fact that the temperature ranged from 102° to 104° F.; pulse 125. Pain in ears slight. Small perforation in right drumhead—left one bulging. Both mastoid processes very tender. Drumheads freely incised. Serous fluid came from right ear, pus from left. Patient's temperature dropped to 101° F. very shortly. The ice-bags were applied. The ears were douched. Patient recovered.

CASE 9.—Miss S., twenty-four years of age, had an attack of grippe and pain in right ear. Ear ruptured. Following day the temperature rose to 104⅖° F. Pulse 118. Tenderness very marked over the mastoid process. Free incision made in drumhead. Ice-coil adjusted. On the following day the temperature fell to 99⅘ ° F. General symptoms much improved. The left ear subsequently became painful, and had to be incised. The Leiter coil was also applied over the left mastoid. Excellent recovery.

Case 10.—Boy, aged eight years, had a bronchial attack, followed last night by an earache. Temperature 102⅗ ° F. Drumhead ruptured spontaneously on following night. Discharge, bloody serum. Mastoid tenderness. Ice-bag applied. Bacteriological examination showed mixed infection — streptococci, pneumococci, and some diplococci. Temperature fell, but on the following day rose to 104 ° F., when symptoms of pneumonia were detected. Boy recovered.

Case 11.—H. C., aged twenty-seven years, had a severe attack of grippe and an earache. The drumhead was freely incised under nitrous oxide gas. As the mastoid was tender, the ice coil was applied. This patient was under my immediate supervision for a period of six weeks, and several times preparations were made to open the mastoid cells, but on each occasion the patient showed some improvement, so that the operation was postponed. The membrana tympani during this time was incised four times. Recovery without a mastoid operation.

Case 12.—Mrs. R., sixty-five years old, for two days had severe pain in the right ear, and the temperature has been as high as 102° F. When I saw her the ear was already discharging, and the mastoid was tender, especially about the lower third. Ice-bag applied, and ear to be douched frequently. Five days later it became necessary to enlarge the opening in the membrana tympani. A subsequent incision was also necessary. Patient recovered in a month's time.

Case 13.—Boy, six years old. For the past week the patient has had a temperature as high as 104° F. Pain slight in ear. Boy very deaf. When called in to see him I found drumheads bulging. Under nitrous-oxide gas I incised both membranes. Ice-bags were applied, and the ears were douched frequently. The boy gradually recovered.

Case 14.—Robert M. P——, thirty-five years old, had an earache for five days. When seen in consultation to-day, the patient was extremely weak, with a temperature of 102° F. He has had but little pain, but he seems very much depressed. When the drumhead was incised, considerable pus escaped. Mastoid process tender. Leiter coil applied. Ear ordered douched. Recovery without opening mastoid cells.

I have purposely given but very brief notes of these patients, as my object has been simply to indicate the general plan of treatment which I am in the habit of following in all cases of acute otitis media, and especially in those cases complicated by acute inflammation of the mastoid cells. A great many cases of mastoid disease can be cut short in the first stage if, instead of administering opiates to relieve the pain, or perhaps phenacetine or quinine to reduce the temperature, which often is very high in the case of young children, we apply leeches at once. If we see the patient at the outset of the attack, we should apply a leech just in front of the tragus, if the middle ear is involved. If mastoid tenderness exists, we should apply a leech behind the auricle, over the antrum, or the lower portion of the mastoid process.

The artificial leech, consisting of a scarificator and cupping glass, is to be preferred to the natural leech because it is always at hand, while natural leeches are frequently very difficult to obtain, especially at night. Most persons, besides, have a great dislike to leeches, and frequently the hemorrhage from a leech bite is very difficult to control. Instances have been reported in which almost fatal hemorrhage has resulted from the use of natural leeches.

The patient in the first stage should be put to bed and given very light diet, especially when there is much temperature. Calomel should be administered in $\frac{1}{10}$-gr. tablets—one every hour for six doses, or until a laxative effect has been produced. Tincture of aconite in one drop doses is also an excellent remedy in the early stage.

If the mastoid process is tender on pressure, and the inflammation of the cells has followed an acute otitis media, the Leiter coil should be applied (after having first used the artificial leech), and the cold should be kept up for at least forty-eight hours. The use of the artificial leech and the application of cold will often cut short the attack. The coil will frequently relieve the pain at once, but should not be left on longer than forty-eight hours for fear of masking other important symptoms. In the meantime the condition of the drumhead should be watched with such care that as soon as there is any bulging a *free incision* should be made in the membrane along its posterior border, from a point behind and below the stapes to the lower border of the drumhead, and close to the bony canal.

In all cases of scarlet fever, measles, diphtheria, influenza, and especially when the infection is due to the streptococcus or pneumococcus, it is advisable to make an early incision in the drumhead, even if the latter is not bulging, especially when there is acute inflammation of the mastoid cells and the patient has considerable fever.

After having incised the membrana tympani, the object of treatment should be first of all to promote the discharge, and this is best accomplished by douching the ear frequently with a warm boracic-acid solution (boracic acid ʒ i, water ℥ viii) or a bichloride solution (1:3000). Secondly we should try to destroy the micro-organisms.

Frequently when spontaneous rupture has taken place, the perforation is so small that the opening should be enlarged. The size of the opening is most important, for the successful outcome of the case depends on a *free incision* having been made. In some cases, after incising the membrana tympani, the surgeon will be disappointed to find that only a slight bloody serous discharge escapes. Usually, however, within twenty-four or forty-eight hours this will be followed by a profuse discharge, and a fall in the temperature.

There is not time this evening nor do I care to discuss the subsequent treatment of acute purulent otitis media by means of astringents or the use of powders, nor do I wish to say anything about the operative treatment of mastoid disease. My object is to lay before you what seems to me the best method of treating acute otitis media complicated by acute inflammation of the mastoid cells. By the use of the artificial leech, of the Leiter coil, by making a free incision in the drumhead, and by frequent douching of the ear with a boracic-acid or bichloride solution, we can in a great many cases cure our patients without performing the mastoid operation.

I do not wish to imply that I am in any way opposed to the mastoid operation, but since I have treated such cases in the manner just described, I have had fewer operations than formerly.

Cases of mastoid disease occurring in connection with chronic purulent otitis media almost always require operation, according to my experience. The outer cortex is usually very dense and the antrum is apt to be filled with cholesteatomatous material. Unless operative measures are adopted in most instances, there is great danger of some intracranial complication.

It is always advisable to examine the pus from the tympanum under the microscope and to have cultures made, for much information can be obtained in this way not only as to the probable severity of the disease but also as to the prognosis. When the infection is due to the presence of either streptococci or pneumococci in large numbers, the disease is apt to run a severe course, and frequently, in spite of all treatment, the mastoid cells have to be opened.

If, after incising the drumhead and applying the Leiter coil, and if, after the appearance of a profuse discharge, the temperature still remains elevated, the surgeon can be very certain, provided the mastoid is still tender, that the case is likely to require an immediate operation. For otherwise the inflammation may in a very few days extend to the sigmoid sinus or to the dura through the tympanic roof. This is likely to occur in the case of children, especially when the infection is due to the presence of the streptococcus or pneumococcus. Such children have a temperature of 104°–105° F., a rapid pulse, complain of but little pain, and lie in a semi-dazed or stupid state, and seem to be very ill. When the pneumococcus is found in the discharge from the ear, we must not fail to examine the lungs, because an elevated temperature in such a case may be due to a central pneumonia, which is not always detected at once.

This conservative line of treatment should never be followed out except by one who has had considerable experience in aural diseases, and can recognize very early the more serious symptoms which would decide the surgeon to open the mastoid cells. The aural surgeon should be in close touch with the patient, and if he does not see him each day, he should be in a position to know his exact condition so that he can operate at a moment's notice in case of necessity.

Some authorities object to the use of cold by means of ice-bags and the Leiter coil, and claim that better results have been obtained from applications of heat. According to my experience, the Leiter coil is one of the best appliances we have for the first or hyperæmic stage of acute mastoiditis; and my statistics show that, since I have been using cold during the past eleven years, the number of operations on the mastoid process has steadily decreased. The Leiter coil should never be used after pus has formed, for then it becomes a most dangerous remedy. It may relieve the pain so that the patient is under the impression that he is improving, but, according to my experience, it is a dangerous remedy to employ except in the stage of hyperæmia.

The aural surgeon should do all in his power to cure his patient without opening the mastoid cells. If, however, the latter operation becomes necessary, he should not hesitate for a moment not only to remove all diseased tissues from the mastoid antrum to the tip, but he should be fully competent and prepared to operate at all times on any intracranial complication.

ANNUAL REPORT OF THE EAR AND THROAT DEPARTMENTS OF THE CITY HOSPITAL IN BASEL, FROM JANUARY 1, 1898, TO JANUARY 1, 1899.

BY DR. E. SPORLEDER, ASSISTANT.

Abridged and Translated by Dr. O. JOACHIM, New Orleans.

THE private policlinic founded by Professor Siebenmann in 1888 became a department of the State University in 1892. A complete in-door department was added in 1896, and the entire service was placed in charge of the founder and two paid assistants. During the year of 1898, 5972 consultations were given in the out-door department to 1365 patients. Of 1073 ear patients 28.27 = 303 suffered from diseases of the external ear; 61.07 = 655 from diseases of the middle ear, of whom 36 had acute purulent middle-ear disease with cholesteatoma; 4 acute cases were complicated with epidural abscess when operated; 24 were operated for cholesteatoma; 10.7 = 115 had diseases of the inner ear. Of 274 cases of disease of the nose and accessory cavities, 14 had empyema of the maxillary sinus, 7 of the frontal sinus, and 1 case had bony atresia of the choanæ. The mouth was affected in 16 cases; in 262 the pharynx; in 142 the larynx and trachea.

In the out-door department, 15 minor operations were performed on the ear, 37 on the nose, 61 on the mouth and pharynx.

Of 152 patients in the hospital department, 76 cases were discharged as cured, 36 transferred to the out-door department, 2 to other departments. Sixteen were discharged improved, 12 not improved. Most of these were patients with diseases of the inner ear, tuberculosis of the larynx and lungs, or other incurable conditions. Three patients died, 7 remained in hospital. One hundred and five patients were admitted for ear diseases, of whom 10 had acute purulent middle-ear disease with mastoiditis, 2 with epidural abscess, 2 with perisinusitis. The complications of chronic purulent middle-ear disease were epidural abscess in 1 case, sinus-phlebitis in 1 case, and cholesteatoma in 17 cases. Thirty-six of the admitted patients had nasal disease, 34 pharyngeal, 11 laryngeal, and 2 other diseases.

In 9 out of 39 ear operations a simple mastoid operation was performed, in 17 Zaufal's operation was made, in 4 the cranium was trephined. Eighty-four operations were performed in the nose, mouth, and pharynx. Of 152 cases admitted, 63 suffered from purulent middle-ear disease, and of these 44 were chronic. Most of the remaining 19 acute cases were complicated by mastoid involvement, 2 by epidural abscess, and 1 by sinus-thrombosis. This case and 2 others with fatal issue will be referred to later. Nearly one half (48 per cent.) of the acute cases with mastoid complications were cured without operation. Absolute rest, politzeration, ice applications to the mastoid, and thorough irrigation with boric-acid solution twice daily sufficed to bring about a cure and a preservation of the function of hearing in cases with moderate mastoid swelling, pain on pressure over antrum, and intense and persisting ear pain for some days or nights. In 9 cases Schwartz's operation had to be performed; among them were 2 cases of epidural abscess, which necessitated trephining of the middle cerebral fossa.

Conservative methods of treatment were tried in all chronic cases which presented no indications for immediate operation. In the simple cases with sufficient drainage in the lower part of the drum and without destruction in its upper posterior margin or Shrapnell's membrane, which indicated disease of the attic, aditus, or antrum, thorough and persistent treatment on the principles of Bezold proved usually successful. In those cases in which the adjoining cavities participate in the production of the purulent discharge, the proper use of Hartmann's middle-ear canula, with careful subsequent drying of the middle ear, was of invaluable service in the treatment. This can always be accomplished, except in children and excessively sensitive patients, if a properly selected canula is used with due care and skill. The moisture remaining in the antrum should be expelled by inflation of air through the canula, and what little may remain on the mucous membrane is absorbed by the hygroscopic boric-acid powder. If the treatment is carried out in this manner, retention of secretion as a consequence of the inflation of boric acid never occurs, and where it has been observed, it was certainly due to the lack of recognition and proper treatment of the diseased adjoining cavities. The cholesteatomatous cases were treated whenever possible in a similar manner. In these cases salicylic acid was added to the boric acid. The results obtained by the described methods were quite satisfactory and observed not less than one year; 52.5 % of the uncomplicated cases were cured, 10.1 % had relapses or remained stationary, in 37.4 % the result is unknown. In no case arose any indication for operation. Of 9 cases complicated with polypoid formation 44.4 % = 4 were cured, 11.1 % = 1 remained stationary, 11.2 % = 1 was operated upon and cured, and in 33.3 % = 3 the result is unknown. Five-sixths of the patients affected with chronic middle-ear discharge without cholesteatoma, in whom the result has been observed for over a year, remained cured. This result may be regarded as satisfactory if we consider the difficulties to properly treat the class of patients which frequents the department. Some of the relapses were due to diving. Other cases, which did not yield to treatment, had a characteristic mucoid discharge, an entire loss of the drum and ossicles, and a sufficiently large aditus to permit of easy and ample irrigation with the antrum canula. There is a marked persistency of this peculiar discharge and a lack of tendency to heal by epidermization. The constitutional anomalous condition of these patients was evidenced by catarrhal inflammations of other mucous membranes, which resisted all treatment. These cases, with usually quite patent Eustachian tubes, present an unfavorable prognosis for operation as well. They show, however, little or no tendency to bone involvement, and with proper cleansing, as a rule, do not imperil the patient's life. General invigorating measures are here especially indicated.

The conservative treatment in the cases with cholesteatoma was less satisfactory: 33.3 % = 12 remained cured for more than one year, 30.6 % = 11 were operated upon, 8.3 % = 3 refused operation, in 27.8 % = 10 the result is unknown. After one month of persistent but ineffective treatment, the operation is advised. The condition of the drum and ossicles determines the extent and method of operation. If they are present, and the hearing is fair, they are not disturbed, and the aditus is exposed only to near its tympanic orifice, in order not to deprive the short process of the incus of its support. Isolated chronic caries of the ossicles is, except in tuberculosis, a rare condition, and macroscopic defects of the malleus and incus are analogous to the conditions of the bony surroundings, and like them due to a rarefying ostitis induced by the excessive irritation of the mucous membrane from the products of decomposition. The removal of the discharge by the establishment of free drainage suffices usually to limit the process of bone resorption. This may even be accomplished by the removal of the ossicles alone, but to the great detriment of the function of the organ. The reported results of improved hearing after ossiculectomy are due to the subsidence of the inflammatory conditions, especially about the fenestrum ovale and articulation of the stapes. The conservative radical operation, which does not disturb the ossicles and remaining part of the drum, is the more serviceable procedure for the patient, as it cures his chronic discharge and preserves the greatest possible amount of the function of hearing. These restrictions are not observed where the ossicles are missing. The usual methods are in these cases adhered to.

Siebenmann described his method of operation in cholesteatoma in the *Zeitschr. f. Ohrenheilk.*, Bd. xxxiii., part 2. He emphasizes that "he guards especially against scraping the bone smooth." The histological examination of the cholesteatomatous matrix shows at all places a tissue like the rete Malpighii, which forms later a desirable substratum for the epidermal covering. Two to four *deep* catgut sutures unite the upper and lower angles of the wound, and hold the upper and lower flap and the soft parts in their respective places. For superficial sutures silver wire is used. The retro-auricular wound is closed at once as the large opening permits perfect supervision. The cavity is tamponed with iodoform gauze, which fastens the outer flap to the posterior wall, unless this flap has been previously stitched to the upper and lower flap. The cavity is tamponed loosely and the first dressing is changed after 3–5 days. After this the dressing is changed, according to the amount of discharge, once or twice daily with careful cleansing of the cavity.

The daily change of the dressing is an all-important factor in the remarkably short time of the healing process. The patient is permitted to leave the bed after the second dressing, in normal cases. After a week a Hartmann's cover-cloth is substituted for the bandage; after a month the patient is usually transferred to the out-door department. In 14 cases out of 17 operated upon, cholesteatoma was present. In 2 cases the cholesteatomatous process was not previously diagnosed. The horny metaplasia was imperfect in these cases and could only be recognized by microscopic examination. The syringing with the antrum canula dislodged at no time characteristic lamellæ, but always some fœtid fluid discharge and some mucus. The hearing improved in many cases and in no case has the hearing become more impaired. The average duration of healing process to complete epidermization was 41.1 days. A closure of the aditus and relapse may occur in the cases where the anterior portion of the aditus was left standing. The usual treatment is indicated in these instances and the apparently callous exudate subsides in twelve to eighteen months. The preservation of the hearing function fully repays for the trouble caused by the disturbance in healing from this source. Cicatricial narrowing or occlusion in the depth of the canal has not been observed. Retrogressive changes in the bony walls have produced in some instances cavities of greater proportions than the operative procedure. This has occurred especially in the region of the aditus and antrum, which seemed to expand in a lateral and backward direction. Necrosis of the flaps or perichondritis did not occur.

The **first** of the **three fatal cases** was a child two years old who had been admitted with otitis med. diphtheritica, sinus-thrombosis, and pyæmia. Complete facial paralysis and left pulmonary dulness existed on admission. The veins of the fundus of the eye were somewhat tortuous and dilated. Swelling and œdema of the left mastoid region. No sinking of the roof of the canal, a stripe of granulating tissue on the edge of tympanum, drum absent, diphtheritic exudate covered the mucous membrane of the middle ear. The operation uncovered a subperiosteal abscess; a fistula near the mastoid tip led to a perisinuous pus accumulation. The sinus was filled with sanguineo-purulent matter. After the operation the child developed muscular and articular metastatic abscesses and died after three weeks with pulmonary complications. The bacteriological examination of the pus showed intercellular diplo- and streptococci, with the peculiarities of the diplococcus intercellul. meningit.

Anatomical diagnosis: Sinus-thrombosis, otitis media diphtheritica, pyæmia, empyema on both sides, bronchopneumonia of both lower lobes, infarcts of the lungs, multiple abscesses, enlarged spleen, enteritis. The sigmoid and transverse sinus form a solid cord, with greatly thickened walls and are filled with detritus and tense fatty masses. The thrombus extends through the jugular bulb far into the vein. The soft parts under the floor of external meatus are infiltrated. Wound of operation covered with pale thin granulations. Drum membrane absent, malleus and stapes enclosed in cicatricial tissue, which occludes the aditus and antrum.

Remarks: The condition of the patient warranted a very unfavorable prognosis. The ligation of the jugular might have been of use, according to Koerner's teaching. The sinus-thrombosis was due to the perisinuous pus accumulation and the facial paralysis to the compression of the nerve trunk by the infiltrated soft parts below the external auditory meatus.

The **second fatal case** was a child three years old with chr. purulent otitis media of the right ear, sinus-thrombosis, epidural abscess, pyæmia. The badly nourished patient had intermittent ear-discharges, which had entirely ceased, until a violent recent recurrence with fever. When admitted the patient had a temperature of 104°, a fast pulse, and some albuminuria; the right concha was pushed forward by a fluctuating swelling over the mastoid which reached to the occiput. Fœtid ear-discharge, narrowing of canal from above, fistula in upper-posterior part of the canal near the drum, which could not be seen.

The incision permits the escape of copious pus from two fine fistulous tracks in the squamous portion of the temporal bone 1 *cm* above the temporal line. The discolored bone extends to the upper posterior wall of the antrum, which is filled with œdematous membrane. A shallow abscess-cavity exists between this diseased bone and the granulating dura. No communication could be traced to the mastoid antrum. On day after operation, chill; temperature 104½°; chills on third and fourth days after operation; on fifth day, paretic condition of left arm. On sixth day, second operation, during which the sinus was freely opened, the bone defect enlarged, and the dura incised. Paralysis of the second lower branches of the facial was noted toward the end of the operation. Patient died the same day.

Anatomical diagnosis: Thrombo-phlebitis sinus dextr., osteomyelitis ossis temp. dextr., abscess in upper lobe of left lung, metastatic abscess in right acromio-clavicular joint. The sinus transversus is lined with a grayish deposit. The jugular vein is of diseased appearance to its lower third. The superimposed glands are enlarged. The petrosal sinuses are free. Small perforations in the drum. Lining of the middle ear inflamed.

Remarks: The chills and characteristic temperature and the implication of the lung left no doubt as to the diagnosis in this case, in which no indications of serious complications were present at the time of the first operation. The sinus-thrombosis was caused by direct contact with purulently infiltrated bone. The autopsy did not clear up the cause of the paresis of the arm and lower branches of the facial nerve.

In extensive disease of the bone the recommendation of Lane always to investigate the sinus should be heeded.

The **third fatal case** was a boy five years old with acute right purulent middle-ear and mastoid inflammation and gastro-enteritis. When admitted he had earache for two days on right side without discharge, diarrhœa, and fever. He developed mastoid inflammation, slight ear-discharge, deep mastoid fluctuation. He was operated upon, granulations were removed and the cavity cleansed. The healing process took a normal course. The child died twelve days after the operation with dyspnœic symptoms.

Anatomical diagnosis: Gastro-enteritis, parenchymatous nephritis, endocarditis verrucos. mitr., operated right middle-ear disease. The examination of the middle ear showed the conditions of receding inflammation.

Remarks: The operation on the ear did not relieve the intestinal symptoms, which remained and resulted in the death of the child. The condition of the ear showed itself clinically and histologically in the process of healing. The coverings and the blood-vessels of the brain were in normal condition.

In twenty-six patients, adenoids were removed with Siebenmann's modification of Gottstein's curette, bromide of æthyl being used as an anæsthetic with much satisfaction. The patients were kept in bed for two or three days, during which fever occurred in some of the cases.

Swelling of all the lymphatic glands, and especially of those of Waldeyer's ring, was observed in a patient, who died two months afterward. They were diagnosed as lympho-sarcomatous glands. A case of primary tonsillar carcinoma with persistent bleeding as its most prominènt symptom was observed. These cases will form the subject of special reports.

Siebenmann's view on the etiology of rhinitis atrophicans fœtida (ozæna) (Meisser, *Arch. f. Laryngol.*, vol. 3; Siebenmann, *Wiener med. Wochensch.* 1899, No. 2) found fresh support in a case which was referred to the institution with the diagnosis of chr. empyema of the right maxillary and sphenoidal sinuses. The patient had a deviation of the septum toward the left side, which was narrow, but otherwise normal. The right side was abnormally large, the inferior turbinal small, the middle turbinal somewhat enlarged and covered with crusts. An exploratory puncture of the right maxillary sinus proved it to be free of accumulation. The condition of the nose and an existing laryngotrachitis sicca yielded to appropriate treatment. The abnormally large lumen of the nose permitted the formation of crusts and fœtor on the metaplastic mucous membrane of the right side, but on the left side the narrowing prevented these symptoms. Metaplasia of the mucous membrane concomitant with abnormal largeness of the nasal passage form the principal factors in the manifestation of ozæna.

The differential diagnosis between rhinitis atrophicans fœtida and rhinitis sicca non-fœtida is at times difficult on clinical examination. We see in the latter usually thin crusts which are only occasionally fœtid, limited to the anterior end of the middle turbinal. The nasal lumen is not increased or markedly atrophic. This trouble occurs mostly in leptoprosopic heads. This condition is frequently mistaken for suppuration of accessory cavities. The microscopic examination of a small section of the mucous membrane of the middle turbinal solves every doubt in the diagnosis of these cases by showing usually an extensive and marked metaplasia of the epithelium. While in these cases curative treatment is of no avail, the correct diagnosis may save the patient from useless operative interference. Hypertrophies on the lower border of the inferior turbinal are usually removed with the scissors devised for this purpose by Heyman. The removal is accomplished painlessly in one sitting and the bleeding is never alarming. A moist gauze tampon is introduced and compressed in the lower meatus and left in position for four days.

Siebenmann's new method of operation for empyema of the maxillary sinus (*Münch. med. Wochensch.* Jan., 1900, No. 1, p. 31) will be further elucidated in a future inaugural dissertation.

For the treatment of lupus of the wing of the nose, Hebra's modification of Cosmi's corrosive paste is used ; to which orthoform for the relief of pain may be added. It consists of ars. alb. 1. 0; cinnabaris fact. 3. 0; ung. emollient. 24. 0. It should be left for three days and the resulting ulceration should be treated with some simple ointment. It is advisable to apply this paste two or three times. To lupus of the nasal mucous membrane a paste of salicylic acid 5% and creosote 5% is applied after removal of the diseased tissue. It is applied on a tampon twice daily for several months until the diseased tissue is replaced by cicatricial tissue which will not permit the penetration of a carefully applied probe.

OTITIC ABSCESS OF THE TEMPORAL LOBE.

BY DR. HERMAN PREYSING, BRESLAU.

Translated by Dr. O. JOACHIM, New Orleans, La.

THE following case gave me the opportunity of examining a brain abscess at post-mortem with especial regard to its exact anatomical relations. The clinical history is also not without interest.

Mrs. M., twenty-five years old, was admitted to the hospital in an unconscious condition. Beyond a right chronic otorrhœa of many years' standing the patient had never been ill. Ear had ceased to discharge of late years. For the past three weeks, she had suffered with intense headache, on the right side more than on the left, and was compelled off and on to keep to her bed. Vomiting occurred once at the beginning of the attack. She had no chill, no fever, no spasms or paralysis; she was able to open the right eye the day before admission, and move the head and limbs. Became unconscious on the way to the hospital.

On admission patient was comatose. Temp. 37.3°; pulse 80, small and soft; respirations 20 and regular; urine normal. She reacted to pricking with a pin and opened her eyes at times voluntarily. Right partial ptosis. Right pupil extremely dilated and fixed. Left pupil, medium, reacted to light. Right eye turned out and down. Patient could not protrude the tongue. The two lower branches of the left facial nerve showed decidedly lessened reaction. Active movement of right arm and leg preserved. Movements of left arm and leg much restricted. Right arm and leg when raised fell back slowly, the left arm and leg quickly. The right arm and leg only responded to pricking. Paralysis was most pronounced in the arm, somewhat less in the leg, and least in the face. Reflexes: Conjunctival—increased.

Masseter—not discernible. Radial and ulnar—weak but equal. Abdominal—weak and equal. Patellar—fairly strong and equal. Foot clonus—marked. Plantar reflex—weak. Tibial reflex—weak. Mechanical muscular reaction—moderate. Vasomotor reaction—active. Sensibility was intact equally on right and left side. Retention of urine; bowels constipated; no nourishment taken.

In right ear, inspissated pus and granulations were visible. Left ear normal. Mastoid processes normal. No optic neuritis. No resistance on passive motion or rotation of head. Percussion of cranium elicited no special sensitiveness. No tenderness over spinal column. The abdomen was not retracted. Patient died on the following night with increasing coma and abolition of reflexes.

Autopsy: The left pleural cavity communicated with the stomach by a large aperture in the diaphragm and contained a litre of coffee-ground fluid and many large floating fat drops. The pleura over the lower lobe and the diaphragm and stomach about the perforation, softened and digested. Heart normal; spleen enlarged. Lungs showed evidence of tracheitis and bronchitis. Uterus contained an embryo of 8 *mm* length.

Brain.—On sawing the skull the dura was injured and an excessive quantity of cloudy serous fluid escaped. A superficial injury to the right temporal lobe at the same time gave exit to a quantity of fœtid, thick, yellowish-green pus. According to our custom in brain cases (apoplexies, tumors, abscesses), the calvarium was not elevated but the meninges and brain were divided by a brain knife in the plane of the bone section.[1]

An abscess cavity filled with thick fœtid, green pus, of the size of an egg, was found in the right temporal lobe. The wall of the cavity was composed of a granular grayish-green tissue, which in turn was surrounded by a firm reddish area representing the capsule of the abscess. The surrounding brain substance was discolored yellow and softened and extended into the frontal and occipital lobes. The volume of the right hemisphere was enlarged and the cortex of the temporal lobe in the neighborhood of the abscess appeared cloudy and contracted. The structures of the thalamencephalon on the right side were enlarged, undefined, and clouded. The median line was displaced markedly to the left, and the right lateral ventricle was compressed. The posterior horn was displaced inward and forward, and separated from the capsule of the abscess at the thinnest part by a layer of tissue 2 *mm* broad. There was a hemorrhagic area, 12 x 2 x 4 *mm*, in the right crus cerebri near the pons, surrounded by a narrow yellowish zone antero-posteriorly; this area extended from the crusta of the right crus to the division between the fourth ventricle and the aqueduct of Sylvius. The lateral ventricle of the left side and the subdural space contained an increased quantity of cloudy cerebro-spinal fluid. The pia mater over the convexity was smooth and not clouded. The convolutions were flattened and those of the right temporal lobe nearly obliterated. The sinuses were free. The inferior surface of the right temporal lobe was adherent to the dura at a point corresponding to the tegmen tympani. At this place the dura was discolored, greenish-black. The abscess became enlarged downward; there was a distinct extension or recess in the wall over the discolored area of dura.

---

[1] The entire upper half of the skull is then slid back and quickly turned over. The section passes above the corpus callosum, through the central ganglia and the lateral ventricles, and gives an excellent outline picture. The entire upper half can then be hardened for microscopic purposes without altering the relation of the parts. The lower part is removed as usual and can be placed in exact apposition to the upper half if desired.

Temporal bone : The lower surface of discolored dura was covered with dirty red granulations directly on the tegmen antri, which showed a defect as large as a pea. The antrum and posterior half of the tympanum were filled with granulations and pus. A polyp projected through Shrapnell's membrane into the canal. The drumhead was thickened and adherent to the promontorium. Carious spots were found on the malleus; the incus was missing, and the stapes embedded in granulations. The mastoid cells were partly obliterated, partly diminished in size, filled with cholesteatomatous masses and granulations. The bone was sclerosed and discolored around the defect.

The microscopic examination of the tissues surrounding the abscess revealed the usual conditions. The thinnest

portion of the abscess wall where it was contiguous to the tegmen was made up solely of young connective tissue. The dura was thickened at this place and showed an increased vascular supply. The connective-tissue lamellæ were forced apart by blood and round-celled infiltration. The endothelium was hypertrophied. A broad layer of granulation tissue lined the lower surface.

Pus found in the abscess, in the granulating masses, and in the cerebro-spinal fluid contained the diplococcus lanceolatus. Examination of the tissue specimens revealed the presence of diplococci in the upper and lateral walls of the abscess, but none were found in the inflammatory zone nor in the dura itself. They were, however, plentiful in the granulating surface of the dura, especially in the parts next to the bone.

The clinical symptoms in conjunction with the anatomical data permit the consideration of three stages in this morbid process.

I. The *stage* of primary ear disease and latent development of the brain abscess; long-standing otorrhœa, formation of granulations, perforation of the tegmen antri, localized pachymeningitis, and abscess formation. This latent condition was interrupted by the onset of the II. *stage*, characterized by intense pain in the ear and head on the right side, a serous leptomeningitis, presumably arising from the pachymeningitis. There were no localizing symptoms. The beginning of the III. *stage* occurred on the way to the hospital. Unconsciousness, paralyses of the arm, leg, and face and of the right oculomotor suddenly set in. This group of symptoms can only be explained by a recent hemorrhage into the right crus. The intense serous leptomeningitis must be regarded as the principal cause of death.

The absence of optic neuritis is a confirmation of the well-known rule that optic neuritis is observed in tumors but not in abscesses of the brain. A definite diagnosis was not possible before the onset of the paralyses. At the same time the existence of severe head and ear symptoms for three weeks in the presence of an old suppurative otitis demanded radical intervention.

Finally, as to the question whether from its locality the abscess should have been approached in a direct or indirect way, it may be stated that our case suggests the following course of procedure: first, the radical operation with exposure of both cranial fossæ; then, if the sigmoid sinus is free, as it was in our case, puncture of the temporal lobe, not in an inward direction, but directly upward from the tegmen.

portion of the abscess wall where it was contiguous to the tegmen was made up solely of young connective tissue. The dura was thickened at this place and showed an increased vascular supply. The connective-tissue lamellæ were forced apart by blood and round-celled infiltration. The endothelium was hypertrophied. A broad layer of granulation tissue lined the lower surface.

Pus found in the abscess, in the granulating masses, and in the cerebro-spinal fluid contained the diplococcus lanceolatus. Examination of the tissue specimens revealed the presence of diplococci in the upper and lateral walls of the abscess, but none were found in the inflammatory zone nor in the dura itself. They were, however, plentiful in the granulating surface of the dura, especially in the parts next to the bone.

The clinical symptoms in conjunction with the anatomical data permit the consideration of three stages in this morbid process.

I. The *stage* of primary ear disease and latent development of the brain abscess; long-standing otorrhœa, formation of granulations, perforation of the tegmen antri, localized pachymeningitis, and abscess formation. This latent condition was interrupted by the onset of the II. *stage*, characterized by intense pain in the ear and head on the right side, a serous leptomeningitis, presumably arising from the pachymeningitis. There were no localizing symptoms. The beginning of the III. *stage* occurred on the way to the hospital. Unconsciousness, paralyses of the arm, leg, and face and of the right oculomotor suddenly set in. This group of symptoms can only be explained by a recent hemorrhage into the right crus. The intense serous leptomeningitis must be regarded as the principal cause of death.

The absence of optic neuritis is a confirmation of the well-known rule that optic neuritis is observed in tumors but not in abscesses of the brain. A definite diagnosis was not possible before the onset of the paralyses. At the same time the existence of severe head and ear symptoms for three weeks in the presence of an old suppurative otitis demanded radical intervention.

Finally, as to the question whether from its locality the abscess should have been approached in a direct or indirect way, it may be stated that our case suggests the following course of procedure: first, the radical operation with exposure of both cranial fossæ; then, if the sigmoid sinus is free, as it was in our case, puncture of the temporal lobe, not in an inward direction, but directly upward from the tegmen.

portion of the abscess wall where it was contiguous to the tegmen was made up solely of young connective tissue. The dura was thickened at this place and showed an increased vascular supply. The connective-tissue lamellæ were forced apart by blood and round-celled infiltration. The endothelium was hypertrophied. A broad layer of granulation tissue lined the lower surface.

Pus found in the abscess, in the granulating masses, and in the cerebro-spinal fluid contained the diplococcus lanceolatus. Examination of the tissue specimens revealed the presence of diplococci in the upper and lateral walls of the abscess, but none were found in the inflammatory zone nor in the dura itself. They were, however, plentiful in the granulating surface of the dura, especially in the parts next to the bone.

The clinical symptoms in conjunction with the anatomical data permit the consideration of three stages in this morbid process.

I. The *stage* of primary ear disease and latent development of the brain abscess; long-standing otorrhœa, formation of granulations, perforation of the tegmen antri, localized pachymeningitis, and abscess formation. This latent condition was interrupted by the onset of the II. *stage*, characterized by intense pain in the ear and head on the right side, a serous leptomeningitis, presumably arising from the pachymeningitis. There were no localizing symptoms. The beginning of the III. *stage* occurred on the way to the hospital. Unconsciousness, paralyses of the arm, leg, and face and of the right oculomotor suddenly set in. This group of symptoms can only be explained by a recent hemorrhage into the right crus. The intense serous leptomeningitis must be regarded as the principal cause of death.

The absence of optic neuritis is a confirmation of the well-known rule that optic neuritis is observed in tumors but not in abscesses of the brain. A definite diagnosis was not possible before the onset of the paralyses. At the same tim the existence of severe head and ear symptoms for th weeks in the presence of an old suppurative otitis de radical intervention.

Finally, as to the question whether from its locality the abscess should have been approached in a direct or indirect way, it may be stated that our case suggests the following course of procedure: first, the radical operation with exposure of both cranial fossæ; then, if the sigmoid sinus is free, as it was in our case, puncture of the temporal lobe, not in an inward direction, but directly upward from the tegmen.

THREE CASES OPERATED UPON FOR OTITIC ABSCESS OF THE TEMPORAL LOBE, WITH FATAL RESULT.

BY DR. F. RÖPKE, OF SOLINGEN.

Translated and Abridged by Dr. EDWIN M. COX, New York.

CASE I.—R. S., aged eighteen years and six months, consulted me March 18, 1900. He is partially deaf, speaks badly, and has the appearance of one who is mentally deficient. He was accompanied by his brother-in-law, who says that the patient has been partially deaf since childhood, and has had discharge from both ears. He has recently complained of pain in the left ear, which has at times been very severe. The patient is pale, fairly well nourished, has a slight left facial paralysis, but no swelling of the mastoid or jugular region. Percussion of the left side of the cranium does not seem painful. His tongue is coated, and breath foul. The right auditory canal is full of pus and cholesteatoma masses, and there is a defect in its posterior wall. The left canal is red and much swollen, and contains the same sort of material as the right. The discharge is very foul. Patient's temperature, 38.0° C.; pulse, 72. Immediate operation was not consented to, and the patient went away, returning in two days with a more intelligent member of his family, who said that he had been unsuccessful at school on account of bad hearing, and for six months had complained of headache, and had frequently had marked convulsive movements of the face. At present nothing further can be got from the patient himself. He was admitted to the hospital, and on March 22d a bilateral operation was done. There was cholesteatoma in the middle ear and in the mastoid cells on each side. No opening could be found in the tegmen tympani on either side. During the next few days the pain on the left side did not cease, but rather extended to the left eye. No appetite, constipation, temperature and pulse about normal.

March 26th.—In the morning there were marked convulsive movements of the face on the right side, later involving the arm. Patient held his ear and cried, using the wrong word, but when corrected was able to repeat "Ohr" properly. Slight hyperæmia of left papilla ; temperature, 38.2° at night ; pulse, 70.

Next day, *operation* disclosed an extradural abscess over the tegmen tympani, the wall of which was very thin. Pus very foul. Dura covered with granulations, no pulsation, and in it a fistula leading into an abscess cavity in the temporal lobe. This contained about 100 *cc* of foul pus and disorganized brain matter. Cavity packed. Temperature, 38.1°. Next day patient felt better, and did not complain. Paraphasia persists ; says "Antel" for "Onkel," etc. Next day abscess washed out, speech disturbance persists ; no convulsions.

April 1st.—Dressing daily ; does not drain well. Paraphasia and amnesic aphasia. Temperature and pulse about normal.

April 7th.—Convulsions of whole right side ; pain in eye and upper teeth ; drain found plugged. Next morning much better. During the next week the patient developed an enormous appetite, and his speech difficulties persisted. Whenever the drain was blocked, convulsions occurred. Morphine used. Progressive emaciation.

April 20th.—Granulations scraped away, and several offshoots of the abscess cavity laid bare. Patient developed a condition of unconsciousness, and died on May 12th in coma.

Autopsy, May 13*th.*—Brain removed. Dura nowhere adherent; covered with granulations in the region of the abscess. Pus in space between dura and pia all over left hemisphere. The left temporal lobe is almost entirely destroyed by the abscess, and what remains is disorganized. There is no abscess wall. The left hemisphere is very anæmic. The apex of the pyramidal portion of the left temporal bone is roughened, dark gray in color, and somewhat softened.

Remarks.—The fact that this patient was deaf prevented a good history from being obtained. The sister told of the headaches and the convulsive movements of the face during a period of six months, which to my mind indicated the development of the brain abscess. It was not easy to say on which side the intracranial trouble lay, because there had been discharge from both ears for years. The left-sided facial paralysis seemed to depend on retention of pus on that side and consequent pressure in the middle ear, and since the subjective symptoms were on the left side it seemed probable that any intracranial suppuration would be on the left side also. Since the pain in the left ear, eye, and teeth did not improve after operation, and since focal symptoms (paraphasia and right-sided convulsions) were observed, the middle cranial fossa was opened and the extradural abscess discovered. After this the prognosis was very unfavorable, since the suppuration in the brain did not cease. The pus was so offensive that very frequent changes of dressing were necessary. The occurrence of meningitis can be dated from April 21st, the day of the last operation, and its protracted course can be attributed to the fact that only the left cerebral hemisphere was involved. The neuralgic manifestations were noteworthy and explained by the autopsy. The previously mentioned carious area at the apex of the petrous portion of the temporal had no immediate connection with the primary focus of disease, and the caries seemed to have been caused by pressure from the abscess, which acted in the same way upon the Gasserian ganglion. This trigeminal neuralgia is mentioned by Barker in one case (*British Medical Journal*, 1888, vol. i.), which recovered, but with occasional attacks of neuralgia afterwards.

Scheir and S. Paget have observed abnormal appetite in cases of abscess of the temporal lobe, and the latter has noted (*Lancet*, May 16, 1891) five cases of bulimia after cranial injuries and concussion. He has also described fourteen similar cases (*Transactions Clinical Society London*, vol. xxx., 1897).

CASE 2.—F. H. Man, æt. thirty-six, recommended for operation April 7, 1900. Has had purulent discharge from right ear since childhood, but without much annoyance until three weeks ago. At that time the discharge stopped and he began to have a dull pain in the right side of his head. Five days ago the patient woke with severe headache, dizziness, nausea, and a temperature of 39°. The headache was right-sided. Patient is dull, the right auditory canal is swollen, and full of foul pus and cholesteatoma masses. There is no pain, œdema, or tenderness in the mastoid region. Parietal region on right side very painful on percussion. Slight right facial paralysis. Fundus oculi normal. Tendon reflexes normal.

Operation on the same afternoon. Antrum diminished in size, sclerotic, and like the aditus and attic filled with pus and cholesteatoma. Necrosis of promontory. No opening in the bone either in the tegmen tympani or in the region of the sinus transversus could be found, therefore the cranial cavity was not invaded. Next morning, felt better, afternoon temperature 38.8°, pulse only 65. Patient felt somewhat better for a week, but on the night of April 14th had pain in right side of head, vomited, and pulse rose to 84, temperature 39.5°. Tegmen tympani was opened and the greenish, non-pulsating dura exposed, from a fistula in which foul pus was escaping. Opening was freely enlarged and the abscess drained and washed out. Next day no headache, and thereafter slow improvement, and after a period of three weeks the patient left his bed, with a small fistulous tract leading to the remnant of the abscess cavity. May 25th : patient began to have headache and was dizzy. Hemorrhage of unknown origin from fistula. June 1st: vomiting, great dizziness, and in the evening unconsciousness. Next day better, no fever, pain in right eye.

June 8th. Granulations scraped away, and region of abscess exposed. No pus.

June 10th. Sudden coma, rise of temperature, and death.

Autopsy next day: dura nowhere adherent, right convolutions somewhat flattened, nothing abnormal in the lateral sinus. No pus between dura and pia, none in the abscess cavity, no abscess wall, whole right hemisphere anæmic ; brain substance in neighborhood of abscess, softened ; in upper part of cavity there is a fresh blood-clot. In the occipital lobe there is a canal a centimetre in length leading into a second abscess the size of a walnut and full of thick green pus. Sections showed that the corpus striatum was full of minute hemorrhages, without any other changes in the vicinity. The whole antero-superior surface of the petrous portion is discolored, carious, and soft. Over the canalis musculo-tubarius there are several defects in the bone. Cochlea almost entirely necrotic.

Remarks: We may consider this case one of acute temporal lobe abscess; the beginning may be put before admission to the hospital, at least the sudden fever and pain indicate this. On admission it was pretty certain that there was an intracranial complication, but even after the first operation there did not seem to be sufficient warrant for opening the cranial fossa, especially since no opening or defect could be discovered leading into the cranial cavity. Since there was no permanent improvement after the first operation the second was of course indicated. The localization of the pain and the tenderness in the parietal region indicated the middle cranial fossa; the facial paralysis and the dizziness were considered to be due to the primary focus of disease and to the necrosis of the promontory. The after-treatment was complicated by the incomplete destruction of the primary focus and by the slow separation of the necrosing cochlea. The exuberant granulations in the neighborhood of this part made it difficult to examine and keep clean the field of operation, and assisted re-infection. The dizziness and headache can apparently be referred to the early involvement of the cochlea. When I saw the patient on June 7th after my absence, there was apparently a new abscess formation, but the last operation did not disclose the secondary abscess in the occipital lobe, though the local conditions were seen to be very unfavorable. The direct cause of death seems to have been the hemorrhage into the corpus striatum, probably due to a pathological change in the walls of the vessels. No microscopic examination was made. There was no syphilitic history to account for the vascular change, and nothing in the gross anatomy of the brain. The pain in the right eye occurring late can be attributed to pressure upon the Gasserian ganglion. The autopsy in this and the preceding case made it surprising that trigeminal neuralgia is not more often observed in cases of abscess of the temporal lobe.

CASE 3.—Child æt. two and a half. Treated by Kronenberg, whom I have to thank for the preliminary history. July 9, 1897, child sick eight days; for two or three days swelling behind ear, discharge from ear for one day. Temperature 39.8°. Operation showed pus in middle ear, antrum, under periosteum, bone very soft, malleus loose in granulations. No communication with cranial cavity. Patient was taken home and did not receive proper care. Wound healed badly, and several small sequestra were removed from time to time. In the middle of September there was partial paralysis of the right arm, which became worse, and, later, convulsions and choked disk occurred. Circumference of head increased. Diagnosis: "Cerebral abscess."

November 10th.—When I first saw the child there was paralysis of right arm and leg, and a foul granulating wound in the left mastoid region. Left pupil contracted; bilateral choked disk.

Operation, November 11th.—No communication between original wound and the cranial cavity can be found. Tegmen tympani chiselled away and the tense unpulsating dura exposed. This was opened and an abscess immediately found at a depth of 1½ *cm* and emptied. Pus foul and under high tension. Cavity washed and drained. Amount of pus was fully 250 *cc*. Next day profuse discharge; convulsions, coma, and death next day after this with high temperature and rapid pulse. No autopsy.

Remarks.—It is very extraordinary that there should have been such a large abscess without breaking into the meninges or the ventricles. Death seems to have been hastened by the operation, though in exactly what way is not clear.

REPORT OF THE MEETING OF THE NEW YORK OTOLOGICAL SOCIETY OF NOVEMBER 27, 1900.

BY H. A. ALDERTON, M.D., SECRETARY.

PRESIDENT, DR. C. J. KIPP, IN THE CHAIR.

Dr. T. PASSMORE BERENS presented a case of **acute mastoiditis—lateral sinus thrombosis—removal of sinus, jugular vein—recovery.**

"V. T.," age fourteen, came to the Manhattan Eye and Ear Hospital, April 14, 1900, with the history that he had had measles four weeks previously, with pain in and profuse discharge from the left ear for two weeks. The mastoid region was tender and œdematous. There was no pain or tenderness in the neck; the temperature was 98⅘° F. The usual mastoid operation was attempted, but in the region of the mastoidantrum the skull was found extremely thin, not more than an eighth of an inch thick between the external and internal tables. The antrum was wanting. One quarter of an inch behind the posterior wall of the canal the lateral sinus was encountered. Below the level of the floor of the external auditory canal the mastoid seemed of normal structure, but was full of pus. A very small fistula was found leading directly into the attic. This, with the attic, was laid open, and the attic curetted. The curetting brought away a necrosed malleus and incus with much granulation tissue. The wound was packed with sterilized gauze, and the patient put to bed. He suffered considerable shock, and the next day his temperature rose, without chill, to 105⅗° F., but began soon to fall, and this condition was looked on as a reaction from the shock of the operation. The next day, April 16th, the temperature rising to 104⅗° F., the exposed sinus was punctured without ether, and found to contain pus. There was no tenderness in the neck. Under ether the lateral sinus was exposed and incised to the jugular bulb; pus only resulted from the incision. The sinus was then further uncovered almost to the torcular before finding a normal condition. The outer wall of the sinus was then dissected off its whole exposed length. The bleeding end of the sinus was packed with sterilized gauze, and an incision was made from the lower end of the wound to the clavicle, and the jugular vein was removed from the bulb to an inch above the clavicle, where it was tied. The jugular vein was completely collapsed to the point of entrance of the thyroid vein and contained but little blood below this. The jugular bulb was freed of blood clots and pus by curetting and syringing with sterile water. In making the dissection for the jugular vein the sterno-cleido-mastoid muscle was found to be unusually broad, so, instead of turning it aside, the muscle was split its whole length. The facial vein contained a short clot, and was tied off external to the clot. The thyroid vein was also tied. Deci-normal salt solution was infused into the abdominal tissues with good effect on the very poor pulse. The temperature fell to 100⅗° F., twelve hours after the operation, but for the four days following it was irregular, rising at times to 103° F. On the fifth day its highest mark was 101° F., and from then on, the temperature gradually fell to normal. Two days following the patient had severe pain in the seat of the infusion of the salt solution into the abdominal tissues; this resulted in an abscess—however, readily handled. Two weeks after the operation a small superficial abscess (metastatic ?) developed just below the left internal ankle-joint, and two days later a similar abscess developed in the same location on the right foot. They both yielded readily and quickly to treatment by drainage and packing. The patient was discharged from the hospital, May 21, 1900, five weeks after the operation. A small superficial wound persisted in the mastoid region, and a few granulations persisted in places along the line of incision in the neck. The patient is before you for examination, and you will notice that the deformity is very slight.

Discussion—Dr. GRUENING: In this case of thrombosis of the lateral sinus, Dr. Berens mentioned that there were metastases in the foot and that they responded promptly to treatment. It is useful to state in such cases the nature of the metastatic process, and its exact location. To say that the metastasis was in the foot is not sufficient; we should know whether the muscles, the tendons, the joints, etc., were affected, and what course of treatment led to the successful result.

portion of the abscess wall where it was contiguous to the tegmen was made up solely of young connective tissue. The dura was thickened at this place and showed an increased vascular supply. The connective-tissue lamellæ were forced apart by blood and round-celled infiltration. The endothelium was hypertrophied. A broad layer of granulation tissue lined the lower surface.

Pus found in the abscess, in the granulating masses, and in the cerebro-spinal fluid contained the diplococcus lanceolatus. Examination of the tissue specimens revealed the presence of diplococci in the upper and lateral walls of the abscess, but none were found in the inflammatory zone nor in the dura itself. They were, however, plentiful in the granulating surface of the dura, especially in the parts next to the bone.

The clinical symptoms in conjunction with the anatomical data permit the consideration of three stages in this morbid process.

I. The *stage* of primary ear disease and latent development of the brain abscess; long-standing otorrhœa, formation of granulations, perforation of the tegmen antri, localized pachymeningitis, and abscess formation. This latent condition was interrupted by the onset of the II. *stage*, characterized by intense pain in the ear and head on the right side, a serous leptomeningitis, presumably arising from the pachymeningitis. There were no localizing symptoms. The beginning of the III. *stage* occurred on the way to the hospital. Unconsciousness, paralyses of the arm, leg, and face and of the right oculomotor suddenly set in. This group of symptoms can only be explained by a recent hemorrhage into the right crus. The intense serous leptomeningitis must be regarded as the principal cause of death.

The absence of optic neuritis is a confirmation of the well-known rule that optic neuritis is observed in tumors but not in abscesses of the brain. A definite diagnosis was not possible before the onset of the paralyses. At the same time the existence of severe head and ear symptoms for three weeks in the presence of an old suppurative otitis demanded radical intervention.

Finally, as to the question whether from its locality the abscess should have been approached in a direct or indirect way, it may be stated that our case suggests the following course of procedure: first, the radical operation with exposure of both cranial fossæ; then, if the sigmoid sinus is free, as it was in our case, puncture of the temporal lobe, not in an inward direction, but directly upward from the tegmen.

portion of the abscess wall where it was contiguous to the tegmen was made up solely of young connective tissue. The dura was thickened at this place and showed an increased vascular supply. The connective-tissue lamellæ were forced apart by blood and round-celled infiltration. The endothelium was hypertrophied. A broad layer of granulation tissue lined the lower surface.

Pus found in the abscess, in the granulating masses, and in the cerebro-spinal fluid contained the diplococcus lanceolatus. Examination of the tissue specimens revealed the presence of diplococci in the upper and lateral walls of the abscess, but none were found in the inflammatory zone nor in the dura itself. They were, however, plentiful in the granulating surface of the dura, especially in the parts next to the bone.

The clinical symptoms in conjunction with the anatomical data permit the consideration of three stages in this morbid process.

I. The *stage* of primary ear disease and latent development of the brain abscess; long-standing otorrhœa, formation of granulations, perforation of the tegmen antri, localized pachymeningitis, and abscess formation. This latent condition was interrupted by the onset of the II. *stage*, characterized by intense pain in the ear and head on the right side, a serous leptomeningitis, presumably arising from the pachymeningitis. There were no localizing symptoms. The beginning of the III. *stage* occurred on the way to the hospital. Unconsciousness, paralyses of the arm, leg, and face and of the right oculomotor suddenly set in. This group of symptoms can only be explained by a recent hemorrhage into the right crus. The intense serous leptomeningitis must be regarded as the principal cause of death.

The absence of optic neuritis is a confirmation of the well-known rule that optic neuritis is observed in tumors but not in abscesses of the brain. A definite diagnosis was not possible before the onset of the paralyses. At the same time the existence of severe head and ear symptoms for three weeks in the presence of an old suppurative otitis demanded radical intervention.

Finally, as to the question whether from its locality the abscess should have been approached in a direct or indirect way, it may be stated that our case suggests the following course of procedure: first, the radical operation with exposure of both cranial fossæ; then, if the sigmoid sinus is free, as it was in our case, puncture of the temporal lobe, not in an inward direction, but directly upward from the tegmen.

THREE CASES OPERATED UPON FOR OTITIC ABSCESS OF THE TEMPORAL LOBE, WITH FATAL RESULT.

By Dr. F. RÖPKE, of Solingen.

Translated and Abridged by Dr. Edwin M. Cox, New York.

Case 1.—R. S., aged eighteen years and six months, consulted me March 18, 1900. He is partially deaf, speaks badly, and has the appearance of one who is mentally deficient. He was accompanied by his brother-in-law, who says that the patient has been partially deaf since childhood, and has had discharge from both ears. He has recently complained of pain in the left ear, which has at times been very severe. The patient is pale, fairly well nourished, has a slight left facial paralysis, but no swelling of the mastoid or jugular region. Percussion of the left side of the cranium does not seem painful. His tongue is coated, and breath foul. The right auditory canal is full of pus and cholesteatoma masses, and there is a defect in its posterior wall. The left canal is red and much swollen, and contains the same sort of material as the right. The discharge is very foul. Patient's temperature, 38.0° C.; pulse, 72. Immediate operation was not consented to, and the patient went away, returning in two days with a more intelligent member of his family, who said that he had been unsuccessful at school on account of bad hearing, and for six months had complained of headache, and had frequently had marked convulsive movements of the face. At present nothing further can be got from the patient himself. He was admitted to the hospital, and on March 22d a bilateral operation was done. There was cholesteatoma in the middle ear and in the mastoid cells on each side. No opening could be found in the tegmen tympani on either side. During the next few days the pain on the left side did not cease, but rather extended to the left eye. No appetite, constipation, temperature and pulse about normal.

March 26th.—In the morning there were marked convulsive movements of the face on the right side, later involving the arm. Patient held his ear and cried, using the wrong word, but when corrected was able to repeat "Ohr" properly. Slight hyperæmia of left papilla; temperature, 38.2° at night; pulse, 70.

Next day, *operation* disclosed an extradural abscess over the tegmen tympani, the wall of which was very thin. Pus very foul. Dura covered with granulations, no pulsation, and in it a fistula leading into an abscess cavity in the temporal lobe. This contained about 100 *cc* of foul pus and disorganized brain matter. Cavity packed. Temperature, 38.1°. Next day patient felt better, and did not complain. Paraphasia persists; says "Antel" for "Onkel," etc. Next day abscess washed out, speech disturbance persists; no convulsions.

April 1st.—Dressing daily; does not drain well. Paraphasia and amnesic aphasia. Temperature and pulse about normal.

April 7th.—Convulsions of whole right side; pain in eye and upper teeth; drain found plugged. Next morning much better. During the next week the patient developed an enormous appetite, and his speech difficulties persisted. Whenever the drain was blocked, convulsions occurred. Morphine used. Progressive emaciation.

April 20th.—Granulations scraped away, and several offshoots of the abscess cavity laid bare. Patient developed a condition of unconsciousness, and died on May 12th in coma.

Autopsy, May *13th.*—Brain removed. Dura nowhere adherent; covered with granulations in the region of the abscess. Pus in space between dura and pia all over left hemisphere. The left temporal lobe is almost entirely destroyed by the abscess, and what remains is disorganized. There is no abscess wall. The left hemisphere is very anæmic. The apex of the pyramidal portion of the left temporal bone is roughened, dark gray in color, and somewhat softened.

Remarks.—The fact that this patient was deaf prevented a good history from being obtained. The sister told of the headaches and the convulsive movements of the face during a period of six months, which to my mind indicated the development of the brain abscess. It was not easy to say

also to catarrhal changes in the membrana tympani. As shown in the photograph, an elliptical incision was made in the posterior portion of the auricle through the integument and connective tissue. This area was dissected out, but the cartilage was not divided. The edges of the wound were then stitched together by sutures, and the auricle was brought into a good position. The supernumerary tragus was also removed. The result was very satisfactory.

Discussion—Dr. EMERSON asked as to the danger of setting up a chondritis in removing cartilage. Dr. BACON prefers not to interfere much with cartilage, because of this danger. Dr. DENCH thought there was not much danger of this complication with aseptic surgery.

Dr. E. B. DENCH reported **a case of epidural abscess.** The patient was a male about fifteen years of age. Several weeks before Dr. D. saw him, he had been in the Hospital suffering from an acute purulent otitis with symptoms of beginning mastoid involvement. All symptoms had disappeared upon incision of the drum membrane, frequent irrigation, and the application of the ice coil to the mastoid. When D. first saw the patient there was profuse discharge from the meatus. The mastoid region was swollen and tender. The œdema and tenderness extended backward for a distance of three or four inches behind the line of auricular attachment. The typical mastoid operation was performed by the house surgeon, Dr. Esterbrook. About three inches behind the posterior margin of the bony meatus, a small sinus was found leading into the posterior cranial fossa. Upon enlarging this opening by means of the chisel and rongeur, an epidural abscess was found lying just above the tentorium. The abscess cavity was completely walled off, and was about the size of a pigeon's egg. The wound was dressed in the ordinary manner, the mastoid and epidural wounds being separated by firm gauze packing. The patient made an uninterrupted recovery. It seems probable that the avenue of infection was from the outer surface of the skull inward to the epidural space, and was due to the fact that the soft parts had been dissected off from the bone by the burrowing of pus along the upper and posterior wall of the canal, out upon the external surface of the mastoid, and from this part backward to the site of intracranial infection.

Dr. GRUENING reported **a case of thrombosis of the left lateral sinus, followed by abscess of the right parotid gland.**

H. B., a boy seven years of age suffering from thrombosis of the lateral sinus, was admitted to the Mount Sinai Hospital and operated upon by removal of the thrombus and ligating of the jugular vein, on April 22, 1900. Until May 9th, the patient did well. On that day the temperature rose and the right parotid gland became swollen. Several abscesses formed in the gland. They were opened and drained. The patient was discharged from the hospital on May 30th, but since had in his parotid gland a fistulous sinus which gradually closed after treatment of about two months.

Dr. GRUENING reported **a case of multiple abscesses of the post-auricular gland.**

The child, two years of age, was sent to the Mount Sinai Hospital to have the mastoid operation done. When she was admitted she had no fever; both ears, the drumheads and external auditory canals, seemed normal. Behind the left auricle there was a conical elastic swelling about one inch in height. The skin covering the tumor was discolored, the apex of the cone being brightened in color and the base dark blue. The incision was made, and a purulent and caseous post-auricular gland was found. The gland was exposed and the child recovered.

Present.—Drs. J. B. Emerson, C. J. Kipp, H. Knapp, N. J. Hepburn, R. Lewis, F. Whiting, A. Duane, W. B. Marple, F. M. Wilson, T. P. Berens, B. Clemens, G. Bacon, C. H. May, E. B. Dench, E. Gruening, F. J. Quinlan, J. L. Adams, M. Toeplitz, E. Fridenberg, J. E. Sheppard, and H. A. Alderton.

Election of Officers.—President, Dr. Herman Knapp; Vice-President, Dr. J. B. Emerson; Secretary, Dr. H. A. Alderton.

REPORT OF THE SECTION ON OTOLOGY AT THE NEW YORK ACADEMY OF MEDICINE.

STATED MEETING, HELD DECEMBER 12, 1900.

BY DR. R. C. MYLES, SECRETARY.

Dr. JAS. F. McKERNON, in the chair.

The importance of a knowledge of ear diseases to the general practitioner.

Dr. WM. H. THOMSON, President of the New York Academy of Medicine, read a paper with this title. The selection of the subject was due to recollections from his own personal experience in general practice for over thirty-five years. Twenty-five years ago he would scarcely have said what he now most decidedly affirmed, that the general practitioner should feel a greater sense of responsibility when called to treat a case of ear disease than he need feel about affections of all the other organs of special sense put together. Like many others in his time, when he was engaged in family practice a slight chronic otorrhœ a in a child gave him but little anxiety. The subject was dealt with, not in a systematic but in a reminiscent fashion, and cases were reported which proved the truth of Carlyle's saying that " Experience is a great teacher, but alack, he demands such dreadfully high wages ! "

A diseased ear may be infected by a pneumococcus, a streptococcus, or a staphylococcus, a bacillus pyocyaneus, or a bacillus coli, and the general practitioner should seek the aid of bacteriologists when he finds an otorrhœa resisting his measures of treatment, for by such help we can make progress in the management of obstinate ear-discharge. The pneumococcus in the ear is the easiest to deal with.

The presence of intracranial organized exudates due to chronic ear-disease often leads to serious consequences and, in his experience, one of the earliest manifestations of such has been the development of myoclonus, notably of the extremities, and particularly annoying when dropping to sleep. Some neurologists speak of this myoclonus as spinal in its origin and term it spinal epilepsy ; he thought this view was wholly incorrect and that these muscular twitchings indicated a cortical irritation which too often was a precursor of true epilepsy. He felt confident that epilepsy due to ear disease is more common than is usually recognized.

The subject of vertigo was considered. He divided it into four varieties :

1. The Gastric or Digestive. This variety supervenes upon gastro-intestinal derangements and its peculiarity is that the patient is generally annoyed and vexed with it but not much frightened.

2. The Cardio-Vascular. When this variety is dependent upon weakness of the heart, nausea is always its accompaniment. When due to cerebral endarteritis, it excites a feeling of foreboding of mischief, and is generally very transient.

3. The Ocular. This form is interesting in having a purely psychical basis. It is the vertigo that causes the head to swim at the brink of a precipice. Its explanation is that the general muscular tonus which keeps us in position has for one of its main elements the information which the eyes are constantly giving us of our surroundings, and when the eyes suddenly find a lack of surroundings, the muscular system as suddenly fails to receive its customary stimulus to maintain tone, and hence general muscular tremor immediately sets in.

4. The Aural. This variety causes the most positive disturbances of all. In that marvellous mechanism of the semicircular canals we carry with us a fluid level, the slightest tip of which is instantly transmitted to the most centric station of nervo-muscular regulation, whereby we know our position in space and behave accordingly. Hence the least derangement causes alarm. Its invariable accompaniment is fear, which may outlast the vertigo itself. All cases of vertigo with a predominant feeling of alarm, or with a story of onset while the patient is recumbent, should lead to a careful examination of the organs of hearing.

Non-operative cases of acute inflammation of the mastoid cells. By GORHAM BACON, M.D. Published in full in this issue, p. 7.

Dr. EDWARD B. DENCH : I was very much interested in the able paper presented by Dr. Bacon to the Society, and as I am rather fond of using my voice, I am sorry that he has left me so little to say. There are one or two things that I do not wish to discuss, but to emphasize. One is the necessity of making an early incision through the drum-membrane, and of making it freely, in cases of acute inflammation of the middle ear. I think, at the present time, almost all of us prefer to use nitrous oxide as an anæsthetic ; that may be a trivial point, but to the patient it means a good deal. Nitrous oxide is the best anæsthetic that can be administered in doing this operation. In reference to the incision, it should be begun a little lower down, opposite the tip of the long process of the malleus, and should follow the insertion of the membrani tympani upward as far as the posterior fold. It should be carried into the vault of the tympanum and then along the upper posterior wall of the external auditory meatus. In this way we relieve the tension within the mastoid. This extension of the incision is a good thing.

With reference to the use of leeches over the mastoid I must say I hardly agree with the reader of the paper ; I do not believe that we should abstract blood from the surface of the process in this way. I believe that the use of the natural or artificial leech applied to the mastoid makes it tender and masks the symptoms, and I have never been able to convince myself that it ever does any permanent good. I believe that it is better not to abstract blood in that way. In making a free incision in the posterior portion of the drum-membrane we get a local depletion. But if we are going to trouble the patient in this way I would prefer the artificial to the natural leech.

With reference to the ice-coil, I believe in its use, but I believed in it more eighteen months ago than now because I have recently had one or two cases in which the real course of the disease seemed to me to be masked by the use of the ice-coil. In some cases it is left on too long ; the rule should be not to leave it on longer than forty-eight hours. I think there is a certain amount of evidence to show that the symptoms are masked by the use of the coil and that later the case requires operation—at least in two instances the mastoid operation was not sufficient ; for in both cases there was intracranial involvement, one being an epidural abscess. Both these patients recovered, but I believe that, in both instances, had the mastoid been operated upon as a primary procedure and the ice-coil *not* used, the more severe operation would not have been necessary. I am heartily in favor of the use of the coil. I believe one should keep the patient under observation and that the tenderness must absolutely disappear before it should be said that the patient is cured. I operated upon a case three weeks ago in the New York Eye and Ear Infirmary where the coil had been on for thirty-six hours. The case was under observation for five days before the operation. The drum-membrane was freely incised and the coil left on for thirty-six hours. Upon removal of the coil there was still a little tenderness. I do not attach as much importance to tip tenderness as do most members of this Society ; I believe tip tenderness exists in a great many individuals. On the other hand, if one gets tenderness over the mastoid antrum on deep pressure he can be absolutely certain that something is wrong. In the particular case cited above, tenderness was produced by deep pressure. I opened the mastoid and found a condition of things which would certainly have led to much destruction of the mastoid if the case had not been operated upon. There was an acute osteomyelitis involving the whole mastoid process—yet this patient seemed to be better after the use of the icecoil.

One other point, regarding the rise of temperature in children being indicative of intracranial involvement. Here I must disagree with the reader of the paper, because these children are prone to a considerable increase of temperature as a result of acute inflammation of the middle ear. I have repeatedly seen a temperature of 103, 104, or 105 degrees with nothing but an acute catarrhal otitis media. In children, if the temperature runs high we need not feel disturbed. But, on the other hand, if in adults you have variations of temperature, or a steadily sustained temperature, this must be often explained on the ground of intracranial involvement. The particular bacillus which characterizes the infection is, I believe, of moment. I believe that if we have the streptococcus infection we are more apt to have a serious involvement of the surrounding structures than if we had a simple infection to deal with. I also believe that this point can be carried too far, for while waiting for the bacteriological examination the patient may die. I think that the clinical history in almost all these cases will enable one to decide whether it is necessary, in one instance, to incise the drum-membrane or, in another instance, to open the mastoid process, or, in a graver case, to invade the cranial cavity to relieve a collection of pus.

I agree with the statement of Dr. Bacon that it is advisable that aurists should become able to meet all emergencies as they occur. The time is past when it should be necessary to call upon a general surgeon to evacuate the pus from the brain, or to open and wash out the lateral sinus and so relieve the patient.

Dr. HERMAN KNAPP: I cannot add very much to what has been said so ably by Dr. Bacon and Dr. Dench. There are two points which I beg to be allowed to discuss. First, about paracentesis of the drum. As a rule, I do not open the drum the first time I see patients with acute otitis media, especially in younger people, even if the drum is red and bulging. I know by experience that by putting these patients to bed and letting them stay there for a day or two, in many cases the redness will disappear and the disease have an entirely different aspect. But if on the next day the redness and bulging of the drumhead have increased, then I open the drum, and do it in the manner described by Dr. Dench in his text-book six or seven years ago: first an incision upward through the posterior half of the drum-membrane, then a short horizontal, and lastly a large and deep incision down the posterior wall of the meatus, forming a tongue-like flap. I have seen very excellent results from this procedure. In comparison with the ordinary opening, which does not evacuate much of the pus, it is a decided advantage. I do not know whether Dr. Dench is the originator of this incision or not.

Dr. DENCH: I think it was Dr. Blake's idea.

Dr. KNAPP: This incision makes an opening just at the tympanic mouth of the aditus ad antrum, securing good drainage for days or weeks to come. If we have to do a paracentesis let us do it thoroughly.

I should like to speak of another point: in regard to the **acute cases that get well.** I do not think it wise to let the patients who once had ear disease with involvement of the mastoid get out of our sight; it is just as important to keep them under observation as patients that have been cured of the acute or secondary symptoms of syphilis. We must follow them up. It is not at all infrequent for these cases to run on for months, the drum-membrane being restored, and everything seeming to be all right. Then symptoms arise which show that, away from the antrum, there is a focus which may bring the patient to the graveyard. Usually in the tip there is a large cavity which will break on the medial side and give rise to an unpleasant abscess. On the other hand, we may have intracranial complications. Some patients seem to be cured for six months or a year, and afterwards die with cerebral symptoms where the diagnosis was not made; only when death has occurred it dawns upon the desolate relatives and the medical attendant that a previous otitis media may have to be blamed for it.

To sum up: At the beginning of an acute otitis, put the patient to bed and give nature a chance; nurse him as you would a bad cold, and you will often abort the inflammation. If not, go on treating the case carefully and persistently, and when the patient has recovered do not lose sight of him: consider him still under your care, and impress upon him that, on account of the intricate anatomy of the mastoid bone, deep and remote morbid foci may lurk under a smooth surface, from which, if undiscovered or unheeded, may prove fatal.

BOSTON MEDICAL LIBRARY. FEB 6 1903

Dr. THOMAS R. POOLEY: I feel lost in endeavoring to make any remarks in this presence. Otology in my own life is a thing apart. Nevertheless, as I practise otology, I feel that I may make a few remarks.

I wish very much that Dr. Bacon had clearer-defined views and more strict rules as to the class of cases considered non-operative. In common with him and all who have done mastoid surgery, I have often been disappointed, and often been very agreeably surprised, at some rapid cures of patients when my first intention was to do an operation. I should like to instance a case. Not long ago, a young lady who had an exacerbation of her chronic inflammation of the middle ear—in so far as chronicity goes it is rather out of accord with the real purpose of the paper—was suddenly seized with acute symptoms and she was placed in bed, Leiter's coil applied, and leeches; strict rest was enforced. I consider that one of the first and paramount importances, in inflammations of the middle ear, is to place the patient in bed. This patient had very little in the way of constitutional symptoms but tenderness over the mastoid. This was speedily relieved by the use of the Leiter coil and leeching. The relief which followed the reapplication of these measures was such that it made one hesitate to operate. There was no rise of temperature; it was normal and even subnormal. I ventured to treat this patient for about ten days or two weeks when, tenderness persisting, I operated, and never have I found, in going through the outer cortex, such complete and universal destruction of the mastoid cells. The case terminated favorably. I cannot quite agree with Dr. Dench; true, it may not be dangerous to operate in these cases, but I think we should try to get our patients well without operation, and have no disfiguring scar behind the ear, which is a great point gained. I agree with the doctor in regard to the importance of paracentesis in many cases of acute trouble.

In the description of cases to-night some of the doctors referred to osteomyelitis. That does not exist in the mastoid cells because there is no medullary canal ; this term should be omitted in speaking of these cases, because if there is no medullary canal there can be no osteomyelitis.

Dr. ADOLPH RUPP : Neither the reader of the paper nor any of the speakers have spoken of the treatment of the originating trouble of middle-ear and mastoid inflammations. Dr. Samuel Sexton, a forgotten writer, relates an instance of cure of the middle ear by aspirating by way of the Eustachian tube. Dr. Hagen (Leipzig) used to direct attention to treating the Eustachian tube itself, in acute cases of middle ear, etc., troubles, by placing a leech at the angle of the jaw just below and behind the auricle. Oftentimes rest in bed will cure coryza or influenza, but some cases need direct and energetic treatment to prevent involvement of the middle ear. Dr. Maleschott in his memoirs tells of a severe attack of coryza that he had when a boy, for the relief of which leeches were applied within the nostrils, and which relieved the severe head symptoms.

Dr. HENRY L. SWAIN, of New Haven : I came rather to listen than to speak. I would like to say, however, that I am very glad to be able to be present at this auspicious opening of this section. It is particularly gratifying to learn from so eminent a physician as Dr. Thomson how highly he values the importance of otology.

On the other hand, I have had great pleasure in hearing from Dr. Bacon that there are in New York some conservative ear surgeons, and that it occasionally transpires that a mastoid may escape surgical interference. I speak of this because of the very generally prevalent opinion outside of New York, especially among the laity, that to go to New York with a pain behind the ear leads invariably to a surgical procedure.

Dr. Bacon's method of treatment involves certain cardinal principles which I have, in common with most of you, always practised and which were given me sixteen years ago in Germany : Free incision of the drum to give free and adequate drainage, local abstraction of blood, preferably by leech, and the application of cold to the mastoid. When these do not stop the trouble, then we have to operate. Personally, I am quite sure that the first point, that of free drainage, is not always thought of enough importance, especially by the vast majority of physicians who are not well versed in this subject. Its neglect undoubtedly leads to the mastoid developments which we are discussing. If incision recommended by Dr. Dench and Dr. Knapp were generally adopted there would certainly be no difficulty on that score. However, I judge that they mean to make this incision only in those cases where the mastoid involvement threatens ominously or actually exists. As to the usual incision to make in all cases, I should consider it absolutely not indicated. These cases should always be treated *pro re nata.* Make a free incision in the drum, and early. If it is not large enough for the purpose, then later enlarge it in the manner suggested. In this way we each year in New Haven find it possible to avoid operating on a number of cases of mastoid inflammation.

Dr. M. D. LEDERMAN spoke about the necessity of asepsis in the external auditory canal before any incision is made through the membrana. The canal should be thoroughly cleansed, as we may introduce infection from the outside. There are a certain number of cases that do not get well without free incision. Paracentesis is a thing of the past. The important thing in the drainage of these cases is to see that the folds of mucous membrane of the middle ear are freely incised; here lies the secret of success in drainage. In cases of tenderness over the mastoid, if we cut through the drum-membrane rather deeply, we may open a sac which acts as a barrier or a ball-valve, and so overcome the difficulty of retention of the secretions in the mastoid antrum. In a certain number of cases, notwithstanding the drainage and douching, we shall have a continued flow of pus, as if the pus arose from a cavity or a sac; in these cases we shall find the mastoid operation indicated. When we mop out the pus in the canal, and find rapid return of the discharge, the mastoid is involved and the antrum is the probable source of the pus.

Dr. JOACHIM, of New Orleans: I do not think I can add anything to the discussion although I may say, in a few words, what my usual practice is in the care of these patients. When called to see these cases it is generally in the evening, and I do not usually make a diagnosis of acute middle-ear disease at once, but order to be instilled a combination of carbolic acid and lysol, and ice applications made to the mastoid region. The next morning, if the condition is better, I continue the cold applications until a certain amount of relief is obtained. But, if the patient is not better, I do not hesitate to make an incision into the drum-membrane which is a very free one. Whenever I make an incision I make a free one, and it is a " Y "-shaped one with the flap turned inward or outward in order to establish free drainage through an opening into the middle ear. This is usually sufficient in the class of cases the doctor refers to and which I take to be acute middle-ear disease with mastoid involvement, not with suppuration. In these cases, with free drainage established, the application of cold is sufficient to cure the patient. When the application of cold within a reasonable time, thirty-six or forty-eight hours, does not give relief, I usually recommend the early operation. In cases of acute middle-ear disease, when it persists after thirty-six hours, in my experience the condition in the mastoid is usually already purulent, and the sooner we give relief the better. In following this practice my results have been as good as the average man's.

Dr. KNAPP : Mr. President, if it is in order to speak twice I should like to say a word in defence of this our glorious though much-abused city of New York. Our colleague, Dr. Swain, of New Haven, speaks of patients coming home with the so-called " New York Ear Disease," which is characterized by deep holes behind the auricle. Very natural : we are obliged to operate more extensively, for our neighbors, far and near, are in the habit of sending us their bad cases ; the good ones they keep for themselves. In regard to cataract, for instance, I dare say that I operate oftener upon second than on first eyes. Eye patients do not die, they only get blind. The physicians in our neighborhood sometimes honor their New York confrères by calling them in consultation, and even the mercantile community are not down on New York. A short time ago, while sitting in a railroad carriage on my way to New Haven, I looked at the houses of the passing villages and towns, and was amused by noticing on many of the merchants' signs the words "New York Prices ! " What does it mean ?

Dr. SWAIN : Those prices do not refer to us !

Dr. ARTHUR B. DUEL : Three years' experience with cases of acute otitis, occurring in acute infectious diseases at the Willard Parker and Riverside hospitals, has nearly convinced me that the ice-coil is not of much use in aborting a case of mastoiditis ; indeed

I am not sure that it is *wise to use cold in cases where it seems pretty certain that* INFECTION *of the pneumatic spaces has taken place.* I say where infection has taken place, because nearly all cases of acute middle-ear suppuration are accompanied by considerable congestion in, and tenderness to deep pressure over, the mastoid process. Such cases are usually relieved by the free incision of the membrana tympani, extended out into the postero-superior segment of the canal wall as described by Dr. Dench. The relief in such cases is undoubtedly hastened by the Leiter coil, but I doubt that it ever does more than put off the evil day when a radical operation must be done, *providing bacteria have already invaded the pneumatic spaces.* Inasmuch as the latter point is a difficult one to determine, although I am still using the coil very often in the early stages for twenty-four or forty-eight hours, I am growing into the opinion that it may be safer to depend entirely on the free drainage, etc., rather than mask important symptoms by the use of cold in many cases, thereby increasing the patient's danger and rendering a more extensive operation necessary by the delay.

This opinion in a way bears out a point made by the reader, regarding the greater virulence of streptococci and pneumococci, since the examination of a large number of cases of late has shown the presence of one or both of these bacteria in all cases which have come to operation, whether ice has been used or not.

Dr. E. L. MEIERHOF : A word regarding the diseases that complicate acute otitis media. Where diabetes mellitus is present it is well not to delay incising the drumhead, for if we delay until there is pronounced bulging, the destructive processes of inflammation are much more marked. In the cases of young children there is frequently difficulty in making a thorough inspection of the drumhead owing to swelling of the canal and the presence of exfoliated skin. In these cases I do not take any chances by waiting, but open the drum cavity at once. This is also especially advisable where the otitis occurs in connection with scarlet fever, diphtheria, and measles. It is better to make an error and operate too early than to have waited too long.

Dr. EMIL MAYER : I should like to add to the history of one of the cases of mastoid disease reported by Dr. Bacon the following facts, which emphasize the statement made by him that recovery is complete and remains so. Case number one cited by the reader of the paper was operated upon by myself for a synechia and exostosis of the bony septum six months ago, about one and a half years after Dr. Bacon had seen him with mastoid disease. There had been no recurrence of his trouble, he made a complete and rapid recovery, and has no mastoid trouble now. This statement may be of interest because we have heard how necessary it is to watch the patients for some time after mastoid involvement has been present.

Dr. GORHAM BACON: I am glad the short paper has brought out so many points of interest.

In regard to what Dr. Dench has said in reference to nitrous oxide gas, I agree with him especially in cases of paracentesis. I find, too, that I am very much in accord in regard to the other points mentioned, except the one of incising, where he carries the knife upwards to make a flap. I limit the incision to those cases where there is a considerable bulging in the upper part of the membrane; I do not incise in all cases. I was glad to hear the discussion on the matter of incisions and I agree with the statements made regarding the dangers connected with it. I purposely selected the cases reported to-night. Keep these patients in bed; the importance of this I referred to in my paper; keep them quiet, and after using the ice-coil watch your patients carefully to see that there is no relapse. As you all know, in the hospital cases, so soon as they are better there is nothing that can keep them in the hospital and so they are apt to have relapses; for this reason it may be inadvisable to use the ice-coil, for the case may subsequently go to operation and reflect upon the hospital.

Dr. Dench referred to the temperature in children; perhaps he misunderstood what I said. After making a free incision in the drum-membrane and after the use of the ice-coil, if the temperature remains high, 104 or 105 degrees, with the mastoid still tender, I said I thought this case probably would have to be operated upon. I agree with what has been said about the temperature in children, but after opening the membrane, if the mastoid remains tender and the temperature remains high, the indications are that there is mastoid trouble.

In regard to the bulging membrane I cannot agree with what has been said if the gentleman referred to cases in which the mastoid was tender, especially if there was temperature and in children. I think it is of the very greatest importance to place these patients in bed and keep them quiet, and to give them calomel. I do not incise the membrane if I am dealing with a simple case of otitis media if the patient has but a slight rise in temperature. I did not mean to imply that I incised every drum-membrane, but if the mastoid shows much tenderness I am inclined to incise the drum-membrane.

In regard to Dr. Pooley's remarks I made but a slight mention of chronic purulent otitis media with mastoid involvement; almost all these cases come to operation. In chronic cases I never use cold. I think we must be careful about waiting too long. I operate very early and watch the case, remove granulations, and secure drainage without applying cold.

In regard to paracentesis I did not refer to that in my paper.

In regard to coryza, I think I referred to the symptoms of mastoid disease and, of course, treated of coryza and other symptoms of like importance. But the paper treated more particularly of mastoid conditions.

Regarding Dr. Duel's remarks about infectious diseases I think a great many cases in the hospital which I see could avoid operation by incising the drum-membrane and applying cold, which I think is of great value.

Dr. William H. Thomson: If I understood Dr. Pooley, he corrected the term osteomyelitis in cases where there was an involvement of the mastoid. The expression in the paper is what is equivalent to osteomyelitis, which, I think, it virtually is.

REPORT ON THE PROGRESS IN OTOLOGY FOR THE SECOND QUARTER OF 1900.

(Concluded from vol. xxix., p. 485.)

BY DR. A. HARTMANN.

Translated by Dr. ARNOLD KNAPP.

MIDDLE EAR.

c.—COMPLICATIONS OF OTITIS MEDIA PURULENTA.

150. **Bezold.** Three cases of intracranial complications in acute purulent otitis. *Münch. med. Wochenschr.*, No. 22, 1900.

151. **Gumprecht.** Dangers of lumbar puncture; subsequent sudden death. *Deutsche med. Wochenschr.*, No. 24, 1900.

152. **Hayden, T. H.** Case of cerebellar abscess; operation; recovery. *Brit. Med. Jour.*, June 9, 1900.

153. **Horne, W. Jobson.** The formation of a circumscribed interdural abscess at the site of the saccus endolymphaticus. *Jour. of Laryngol.*, June, 1900.

154. **McKernon, James F.** Sigmoid sinus thrombosis. *Laryngoscope*, May and June, 1900.

150. CASE 1.—Three weeks after onset of an acute purulent otitis, the discharge had ceased and hearing had become nearly normal; symptoms of sinus phlebitis, pyæmia, and metastatic foci in the lungs set in. The sinus was exposed three days later and found to be discolored, yellowish-green, and covered with a thin membrane. The temperature dropped to normal but rose suddenly, after a week, with a chill. At the second operation ten days later the jugular vein was ligated, the sinus laid bare to the jugular foramen, and a fistula in the sinus was discovered. Pus and masses of thrombus were evacuated. Prompt recovery took place with cure of the optic neuritis and abducent paralysis.

CASE 2.—Acute purulent otitis after erysipelas. Gravitation abscess. Mastoid and abscess opened, purulent contents evacuated. The temperature rose on the second day to 40° and the jugular vein was ligated and the sinus exposed. The latter structure appeared healthy and free bleeding occurred from a torn blood-vessel, hence the sinus was not incised. The temperature remained normal from the third day.

CASE 3.—Acute purulent otitis for eight weeks without perforation of drum. Severe pain in ear and head. Insomnia, chill. A subperiosteal abscess had been present one *cm* behind the auricle for four weeks. Pus was found in the mastoid cells at operation and a fistula leading to an extradural granulating area and then to an abscess in temporo-sphenoidal lobe. This fistulous opening was enlarged and gauze introduced. The wound was healed in nineteen days. The subperiosteal abscess resulted probably from the bursting outward of the brain abscess. SCHEIBE.

151. GUMPRECHT relates the unpleasant accident where the needle broke off as the patient made an unexpected movement. The fragment was extracted with the forceps. The patient, of course, should keep perfectly quiet while the needle is in the vertebral canal. In another patient, a paralytic, on the day following, staggering gait and severe pain in the back appeared. These symptoms are supposed to be due to a too rapid evacuation of the spinal fluid. The fluid should escape very slowly and the pressure should not drop below 40 *mm*. Gumprecht reports seventeen cases of sudden death after spinal puncture (two of his own). These patients nearly all suffered from brain tumors, usually in the posterior cranial fossa, with distinct signs of increased intracranial pressure before puncture. Paralysis of respiration was characteristic; the heart continued to beat for a half to several hours, while artificial respiration was kept up. At autopsy the cavities situated centrally from the tumor were found widely dilated, while in a spinal direction they were narrowed. The stoppage between the cerebral and spinal lymph takes place by direct pressure of the tumor at the aqueduct or of the cerebellum in the region of the foramen of Magendie. NOLTENIUS.

152. A lad who had been operated on in 1896 for "intracranial abscess, probably cerebellar," on the left side, was well until January 14, 1900, when he began to have headache and vomiting. He was seen on the 17th, when he complained of severe frontal and occipital headache, chiefly on the left side. He was drowsy and apathetic, taking a long time to respond to questions.

Tongue foul, bowels constipated. Pulse : 60. Respir.: 17. Temp.: 97° F. No paralysis. Pupils equal and reacted to light and on accommodation. Slight lateral nystagmus. Right knee-jerk slight, the left hardly perceptible. No swelling or tenderness over the mastoid. Epithelial debris only, in the meatus. January 22d, at 11 A.M., he was almost unconscious ; he could move both arms, but the left seemed rather weaker than the right. At 4 P. M. he was comatose, breathing noisily. The left arm was quite limp ; the face was paralyzed on the left side. The operation was entirely successful, the patient leaving the hospital on March 10th in good health and quite healed. The eyes after the operation showed signs of double optic neuritis. There is no mention of vertigo in the report. CHEATLE.

153. HORNE describes two specimens obtained from the postmortem room. In each, pus from the labyrinth had passed through the aqueductus vestibuli.

The first was the right temporal bone of a boy aged nineteen years, who died with meningitis and thrombosis of the lateral sinus, having suffered from otorrhœa nearly all his life. The middle ear was much disorganized, with a carious roof, a patch of pachymeningitis corresponding to the caries. In the posterior fossa, immediately below the superior petrosal sinus in the neighborhood of the site of the saccus endolymphaticus and stretching across the lateral sinus, was an abscess sac. This abscess had perforated in two directions : below, into the sinus, causing thrombosis ; and above, causing leptomeningitis of the posterior fossa. The labyrinth, which had been infected from the middle ear by caries around the oval window, contained dark brown pus. Bacterioscopic examination of the pus from the middle and external ear yielded a diplococcus as well as staphylococci and streptococci.

The second was the right temporal bone of a man aged thirty-seven years, who also died with meningitis and thrombosis of the lateral sinus and had suffered from suppuration in the middle ear since childhood. The middle ear was disorganized. The labyrinth contained pus which had tracked through the aqueductus vestibuli and formed an abscess sac between the layers of the dura mater at the site of the saccus endolymphaticus, bursting through to the post. fossa. The sinus contained an ante-mortem clot. Horne questions whether the pus occupied the saccus endolymphaticus itself. The method by which the sinus was infected is of great interest. CHEATLE.

154. McKernon reports *seven cases of sigmoid sinus thrombosis* with cerebral, cerebellar, and internal jugular-vein complications. A careful study of these cases is made, and an interesting symptomatology is added to the paper.

A sudden rise in temperature, with remission and profuse sweating, is one of the most positive signs of sinus thrombosis. Chilly sensations should occasion suspicion, especially where discharge from the ear has existed for any length of time. Non-infective thrombosis gives no history of chills. The fluctuations of temperature depend upon the amount of septic material already in the circulation. A cerebral abscess may lower the temperature materially. In one case, where the temperature was normal, the pulse remained rapid for several weeks after the jugular resection. Pain is generally more severe than in uncomplicated mastoiditis. It is referred to the side of the head and occipital region over the torcular. When pain extends along the course of the internal jugular, it is due more often to the infected glands than to obstruction in the vein. This observation was demonstrated in two cases. Nausea and vomiting are nearly always present, in greater or less degree. In the early stages the respiration is little affected : later it becomes very rapid. Vertigo was not observed in any of the cases. Consciousness was diminished in all but one case. A neuro-retinitis was found in two of the cases. Constipation seems to co-exist in the early stages of this disease ; it was present in all the cases. Griesinger's symptom was present in five. An effort was made in four cases to verify Gerhardt's observation of increased flow of blood through the unaffected vein, but without avail. Marked stiffness of the neck on the affected side was present in all the cases to a greater or less degree. The existence of the hard, cord-like swelling along the course of the internal jugular was never satisfactorily detected, although at the operation in one of the cases the vein was found enormously distended and contained a very firm clot. The lymphatic glandular involvement, while a valuable aid in diagnosis, does not always indicate phlebitis, as the same may occur in a Bezold perforation.

Under the subject of treatment, McKernon advises a free exposure of the sinus. If aspiration be negative, it is better to open the sinus than to remain in doubt. In non-septic thrombosis the jugular is not excised, but opened, the clot in the sinus is removed, and the return flow well established from both ends. Where there is pus or broken-down clot in the sinus, the jugular should be ligated at the clavicle and excised to the bulb. All enlarged glands should be removed. The streptococcus is the micro-organism considered responsible for the development of these septic conditions.

After a prolonged operation the best form of stimulation is a hot saline enema. Oxygen is given at stated intervals for a period of four or five days following the operation. CLEMENS.

d.—OTHER MIDDLE-EAR AFFECTIONS.

155. **Duel, Arthur B.** The value of electrolytic dilatation of the Eustachian tubes in chronic tubal catarrh and chronic otitis media. *Amer. Jour. of the Med. Sci.*, April, 1900.

155. The successful application of electrolytic dilatation in chronic catarrhal conditions of the Eustachian tubes and middle ear has led DUEL to urge its preferment to other methods now in use. A tabulated report of fifty cases is submitted for study; many of the patients being either entirely relieved or much improved from the existing vertigo and tinnitus aurium, by restoring the patency of the Eustachian tubes. The hearing distance was increased, more or less, in nearly half the cases.

The bougies are made of gold and correspond to the numbers 2, 3, and 4 of the French scale. The bougie used should fit the tube snugly, so that the current can be kept in firm contact with the hyperplastic tissue long enough to ensure electrolytic action. The bougie is attached to the negative pole ; the positive pole is held in the patient's hand. If an obstruction is encountered during the passage of the bougie, it is overcome by using from one to three m. amp. of current, when, after twenty seconds to a minute of contact, the bougie will pass over the softened mass with gentle pressure. Forcing the bougie is deprecated. Increased current strength, up to five m. amp., is used where the obstruction is more difficult of reduction. Time of contact should not be longer than five minutes at one sitting. Applications can be repeated at intervals of one week to one month, depending upon the results obtained by the use of inflation every other day. Two or four sittings are usually found to be sufficient. A battery of thirty to fifty volts is required.

Quite a number of conclusions are submitted for consideration ; among them we note number six : "Where the obstruction is due to an organized exudate, the best method for its removal is electrolysis, for the following reasons : (*a*) It is more rapid ; (*b*) it is more efficient ; (*c*) the results are more permanent."

J. B. CLEMENS.

NERVOUS APPARATUS.

156. **Sugar.** Diseases of the ear in influenza, especially influenza cerebralis. *Arch. f. Ohrenhlk.*, vol. xlix., p. 59.

157. **Sternberg.** On the so-called tumors of the acoustic nerves. *Zeitschrift f. Heilkunde*, 1900, p. 163.

158. **Barth.** The symptomatology of hysterical deafness. *Deutsche med. Wochenschr.*, No. 22, 1900.

156. A form of influenza causing meningeal and other symptoms has long been known as influenza cerebralis. Hyperæmia and hemorrhages in the membranes and brain substance occur, probably on account of the change in the vascular walls described by Bäumler. Destruction has also been observed, which SUGAR considered to be due to hemorrhagic infiltration in the labyrinth. Bone-conduction is wanting, subjective noises and vertigo are present, and the eye grounds are hyperæmic. A significant case is briefly related.

BLOCH.

157. STERNBERG examined five cases histologically, and with a review of the literature concludes that the tumors are frequently of a mixed gliomatous nature. These develop probably from embryonic remnants in the area of the dorsal cranial nerves and do not necessarily stand in direct connection with the latter. A case described by Politzer in his text-book is missing in the literature.

BRÜHL.

158. A previously healthy, eleven-year-old girl, without hereditary taint, suddenly became totally deaf after a fright, and one week later, without cause, the hearing returned. After one week total deafness again came on after a fright ; examination of the ear showed no anomaly beyond slight retraction of the drum. The deafness remained for ten weeks and then suddenly disappeared again. BARTH made the interesting observation that unconscious musical perception was preserved for all tones and noises. The girl was able to sing a song correctly in the key in which it was played on the piano, though even the loudest tones could not be heard. Bone-conduction did not convey any hearing perception, according to the patient. According to Barth the girl had lost by the psychic force of the fright the faculty to translate auditory perception to consciousness, and that musical hearing as a sub-

division of the auditory sense functionates at a considerable level below consciousness. NOLTENIUS.

NOSE.

a.—ANATOMY AND PHYSIOLOGY.

158A. **Zwaardemaker.** Compensation of olfactory sensations. *Arch. f. Anat. u. Physiologie*, 1900.

159 **Zwaardemaker.** The smelling power of solutions of different concentration. *Arch. f. Anat. u. Physiol.*, 1900.

160. **Zwaardemaker.** Sensations of smell, their combination and compensation.

158A. Experiments to show that olfactory irritants may compensate one another; a combination of weak irritants causes compensation, of strong irritants a contest, where the uncompensated-for part only is perceived. BRÜHL.

159. Olfactometric threshold measurements for eucalyptol, eugenol, anethol, vanillin, capron acid, ethyl bisulphid, cumarin, and scatol. BRÜHL.

160. The importance of olfactory sensations is described, also olfactometric experiments and a double olfactometer to study olfactory combinations. BRÜHL.

b.—METHODS OF EXAMINATION AND TREATMENT.

161. **Fränkel.** Remarks on the bad odor from the mouth. *Arch. f. Laryng.*, vol. x.

162. **Douglass, Beaman.** Galvano-cautery in the nose. *N. Y. Med. Journ.*, May 12, 1900.

161. Practical remarks on the differential diagnosis of the focus giving rise to the odor in the nose, mouth, or pharynx, and suggestions for treatment. ZARNIKO.

162. DOUGLASS studied the results of galvano-cautery microscopically, fully described the changes, and derived the following deductions: The cautery should never be used superficially or over a large surface, and should be rapidly introduced under moderate heat into the deeper structures, which should be destroyed under greater heat. The cautery knife as well as linear cauterizing should be discarded, except for superficial effects, in ulcers. The cautery can be used on the nasal septum, only for destruction or dilatation of the venous sinuses of the tuberculum septi. The middle turbinate, upper septal region, nasal roof, ethmoidal region, and outer nasal wall should never be cauterized. Adenoids,

hypertrophied faucial and lingual tonsils, are well suited for this method. The uvula, faucial pillars, arytenoid region, and glosso-epiglottic folds may be but superficially cauterized owing to danger from œdema. M. TOEPLITZ.

c.—OZÆNA.

163. **Gerber.** Chameprosopia and hereditary syphilis in relation to platyrrhinia and ozæna. *Arch. f. Laryng.*, vol. x.

164. **McKinney, Richmond.** Purulent rhinitis of childhood in the production of atrophic rhinitis. *N. Y. Med. Journ.*, June 30, 1900.

Atrophic Rhinitis. Discussion held in the laryngological section of the New York Academy of Medicine, March 28, 1900. *The Laryngoscope*, May, 1900.

165. **Bosworth, Francke H.** The etiology of chronic atrophic rhinitis.

166. **Rice, Clárence C.** The importance of distinguishing functional collapse of the nasal tissues from atrophic rhinitis.

167. **French, Thomas R.** The hygienic and general treatment of atrophic rhinitis.

168. **Delavan, D. Bryson.** The mechanical treatment of atrophic rhinitis.

169. **Knight, Chas. H.** Atrophic rhinitis; its treatment by local medication.

163. From measurements of 200 patients, of whom 100 suffered from ozæna, GERBER agrees with Hopmann that in the noses of ozæna patients a distinctly shortened septum and correspondingly deepened naso-pharynx were present. Platyrrhinia, chameprosopia, and epithelial metaplasia were also frequently found. The connection is the following:

1. A true fœtid atrophic rhinitis is always present where certain developmental interferences of the nasal skeleton are combined with epithelial metaplasia and certain regressive changes in the mucous membrane. 2. These arrests of development in the nasal skeleton usually occur in their natural combination with the corresponding form of facial skull (chameprosopia—platyrrhinia). They may be produced in other cases by pathological processes, especially by hereditary syphilis. 3. Exceptionally the picture of fœtid atrophic rhinitis may appear in the combination of broad nasal cavities and epithelial metaplasia. ZARNIKO.

164. MCKINNEY observed two brothers, aged nine and seven years respectively. The older, with a clear history of a former continuous purulent discharge with some evidence remaining, presented an advanced atrophy of the turbinated bodies; in the younger, a purulent discharge existed without atrophy in one side

and the atrophic process going on in the other. There was no hypertrophy of the pharyngeal tonsil present in these cases, which bear out Bosworth's views on the causation of atrophic rhinitis.
M. TOEPLITZ.

165. Atrophic rhinitis is developed from purulent rhinitis of childhood, not from hypertrophy of the mucous membrane. The suppuration destroys the secreting surface, the secretion becomes inspissated and dries into crusts which interfere with the circulation. In a certain proportion of cases there was evidence of malnutrition which could not be traced to syphilis, tuberculosis, scrofula, or other constitutional disturbances. M. TOEPLITZ.

166. Dryness of the mucous membrane of the nose and throat is not to be confounded with atrophic rhinitis. In the etiology of the latter, hereditary influences and acquisition in the earliest years of life are most important. Dryness is one result of general malnutrition, due to inadequate food, bad air, or to life spent among unsanitary conditions. Functional collapse is due to anæmia. Excessive use of alcohol or tobacco produces mouth-breathing, due to swelling of the erectile tissue, which, in turn, causes dryness. The treatment of the functional inactivity should be constitutional. M. TOEPLITZ.

167. **FRENCH** confines his task to the questions, how to cleanse and how not to cleanse the nasal passages and nasal pharynx in atrophic rhinitis. For this the douche and post-nasal syringe are used. French militates against the leather plunger soaked in oil. Cultures made from scrapings from the inside of the barrel, curved tube, and leather plunger were injected into peritoneal cavities of guinea-pigs, which died from sepsis. Syringes should be made of thin metal with asbestos plunger, which can be boiled. Atomizers with metal stems should also be boiled. Alkaline solutions are better than antiseptic ones. He uses saline washes before and after a spray of peroxide of hydrogen. Constitutional treatment of anæmia, change of climate, tonics, out-of-door exercise, and daily baths are advised. M. TOEPLITZ.

168. The mechanical treatment of atrophic rhinitis consists of: (*a*) treatment by mechanical means, such as tampons, plugs, and bougies; (*b*) removal of diseased membranes by means of the curette; (*c*) treatment by various forms of electricity: galvano-cautery, vibratory massage, electric current, and interstitial electrolysis. For the effective prevention of atrophic rhinitis, obstructive

conditions of the nasal and pharyngeal regions should be promptly recognized and relieved, since atrophy has lately become of rare occurrence on this account. M. TOEPLITZ.

169. The best alkaline wash is the normal salt solution, which prepares the surfaces; then menthol in albolene spray (5 gr. to ℥ j), formaldehyde (1 : 5000), ichthyol with keroline (2 % and 5 %), and gomenol, distilled from the leaves of "Melaleuca viridiflora," one tube to a quart of water (2½ parts to 1000); also in albolene (5 parts in 1000). M. TOEPLITZ.

d.—NEOPLASMS OF THE NOSE.

170. **Hasslauer.** Benign tumors of the septum. *Arch. f. Laryngol.*, vol. x.

171. **Escat.** Removal of naso-pharyngeal fibromas by the natural passages. *Arch. Internat. de Laryngol.*, etc., vol. xiii., No. 2.

172. **Tilley, Herbert.** Tumor of nasal septum. *Proc. Laryn. Soc.*, London, March, 1900.

173. **Cumming, John,** and **Mackenzie, Hunter.** A case of nasal granuloma, probably tuberculous. *Brit. Med. Jour.*, July 7, 1900.

174. **Lack, H. Lambert.** Two cases of nasal polypi treated by a new radical method, with microscopic sections of the bone removed.

170. HASSLAUER gives a careful review of the literature on benign tumors of the septum and adds several personally observed cases from the Würzburg clinic.

281 tumors of the septum are divided in the following groups: The tuberculomas come first with 81 cases, followed by the bleeding septal polyp in 57. In these two groups the preponderance of the female sex is striking. There were 35 cases of warty tumors (papilloma durum, 20; papilloma molle, 15). Fibroma œdematodes 30 cases; syphiloma, gumma, etc., 26; polypoid hyperplasia, 16; fibroma, 9; myxoma, 6; adenoma, 4; enchondroma, 4; cysts, 3. Finally 10 cases of isolated tumors.

ZARNIKO.

171. ESCAT discusses the treatment of the naso-pharyngeal fibroma. He operates in narcosis with dependent head, grasps the tumor, and cuts through its base with two specially constructed angular curettes. SCHWENDT.

172. A woman, aged sixty-two years, after suffering with nasal obstruction and epistaxis for six months, was found to have a dark red, broadly pedunculated tumor growing from the neighborhood of the septal tubercle. The growth recurred after removal with

the cold snare, which was attended by profuse hemorrhage. The growth was thought to be an angio-fibroma. CHEATLE.

173. A female patient complained of complete obstruction of, and occasional severe bleeding from, the right nasal passage, of about one year's duration. The passage was found blocked by a reddish-brown polypus, which on probing was found to be freely movable and very vascular. On attempting to remove it with a snare it was found to be very friable. A pair of dressing-forceps pointed with cotton-wool was introduced and the whole growth was easily detached and pushed into the posterior nares. Severe hemorrhage, necessitating plugging of the nose, followed. The growth was about two inches long and had been attached along the ridge of the middle turbinate. It was of a reddish-brown color interspersed with white streaks. Microscopically, it was found to be a "granuloma with giant cells, probably tuberculous." Enlarged glands in the neck had been removed about two years previously. No indication of pulmonary tuberculosis.

CHEATLE.

174. LACK thoroughly scrapes the region of the middle meatus with Meyer's ring knife under gas anæsthesia. Both cases did well. The sections showed a condition of the nature of rarefying osteitis. Periosteum, much thickened, especially in deeper layer, which consisted of rows of large nucleated cells. The surface of the bone was ragged from the formation of numerous little bays which were filled with very large, often multinucleated cells. The bone cells were larger and more numerous than the normal, especially where the bone was invaded. In places, the changes had advanced so far that the bone was entirely broken up into fragments, surrounded by osteoclasts, and evidently undergoing absorption. CHEATLE.

e.—ACCESSORY CAVITIES.

175. **Moskowski.** Demonstration of influenza bacilli in the pus of an acute empyema of the maxillary antrum. *Arch. f. Laryng.*, vol. x.

176. **Warnecke.** Eleven cases of chronic empyema of Highmore's antrum cured by the Krause-Friedländer method from the lower meatus. *Arch. f. Laryng.*, vol. x.

177. **Avellis.** The termination of acute empyema of the maxillary antrum in caseation; its clinical recognition and chances for cure. *Arch. f. Laryng.*, vol. x.

178. **Habermann.** On cholesteatoma of the frontal sinus. *Zeitschr. f. Heilkunde*, vol. xxi., No. 6.

179. **Tilley, Herbert.** A case of chronic ethmoiditis simulating so-called "cleavage" of the middle turbinate. *Proc. Laryng. Soc.*, London, May 5, 1900.

180. **Spencer, W.** A case of extensive necrosis following nasal polypi and sinus disease. *Proc. Laryn. Soc.*, London, April, 1900.

181. **Pooley, Thos. R.** Necrosis and empyema of the frontal sinus. Operation. *Annals of Otology, Rhinology, and Laryngology*, May, 1900.

175. MOSKOWSKI was able to grow on cultures Pfeiffer's influenza bacillus in addition to staphylococci, streptococci, and diplococci. He believes that the influenza bacillus was the causative factor and the other bacteria were of secondary importance. The latter, however, may become more active under favorable conditions and transform the benign acute into a chronic empyema.
ZARNIKO.

176. WARNECKE, discouraged by the long after-treatment after the broad opening through the canine fossa and the incomplete results following Cowper's method, treats chronic empyema of the maxillary antrum according to the Krause-Friedländer dry method and has achieved very satisfactory results. For re-examination, with a view to recurrence, transillumination was used.
ZARNIKO.

177. AVELLIS reports three cases of maxillary empyema of several years,' of several months,' of several weeks' duration, respectively. Irrigation was difficult and evacuated a thick, cheesy, crumbly, and very fœtid pus. In each case, unexpectedly, recovery followed the single irrigation ; it was permanent and the subjective symptoms remained absent. The author concludes : An acute empyema may not heal nor become chronic, but may undergo caseation. This caseation acts like a foreign body and produces suppuration, which may continue for a long time but does not necessarily become chronic, as it ceases as soon as the purulent mass is removed. The microscopic examination of the caseous empyema gives a probably favorable diagnosis, which is assured by a second irrigation. The clinically observed cases are too few to give any further characteristics. The main complaint was the terrible odor; headache, supraorbital pain, and the usual daily cycle of symptoms in a chronic empyema were not pronounced, and the quantity of discharge was not great. ZARNIKO.

178. A man, fifty-seven years old, with a fistula below the right eyebrow, lasting nine months, after frontal empyema. Several years later, symptoms of retention. The fistula discharged again.

At operation cholesteatoma was found present. Its formation occurred presumably as in the middle ear; emigration of epidermis through the fistula with formation of pseudo-cholesteatoma. The epidermal covering of the cavity was preserved at the operation and a permanent opening established beneath inner end of eyebrow. BRÜHL.

179. A girl aged eighteen years complained of severe pain over the nose and around the right side of the face. The middle turbinal was easily visible, and on its under side a well-marked swelling was present. The antrum had been explored with a negative result. CHEATLE.

180. A woman aged forty years had for many years suffered from polypi and suppuration in the antrum and ethmoidal and frontal sinuses. Extension had taken place by the nasal duct, causing purulent conjunctivitis, which had left a central corneal opacity. The antrum and interior of the nose had been actively treated, and the front wall of the frontal sinus, including the upper margin of the orbit, had been removed. A long sinus remained extending backwards to beyond the anterior sphenoidal fissure, where dead bone was to be felt. Scraping in this region had been attended by profuse hemorrhage. CHEATLE.

181. The patient, æt. thirty-eight, a male, had syphilis sixteen years ago. In 1895 influenza was followed in two weeks by scarlet fever, during which an abscess had formed in the orbital region, associated with orbital cellulitis, which broke in the superciliary region midway between the canthi. After repeated operations the sinus closed. However, in the spring of 1899 the discharge started anew and frontal-sinus disease was diagnosed but was not radically operated upon until January, 1900. Through an incision along the upper border of the eyebrow the sinus was fully exposed, two small nasal and one frontal sequestra and many polypoid granulations being removed. The patient made a good recovery. The ectropium was not relieved by the operation.

M. TOEPLITZ.

f.—OTHER NASAL AFFECTIONS.

182. **Morf.** Congenital choanal closure. *Arch. f. Laryng.*, vol. x.

183. **Grant, Dundas.** A case of rhinoscleroma. *Laryng. Society*, London, April 7, 1900.

184. **Freeman, Walter I.** A case of rhinoscleroma. *Annals of Otol., Rhinol., and Laryng.*, May, 1900.

182. The patient, aged forty-three, presented a partly bony choanal closure on the left side, pronounced hypsistaphylia, leptorrhinia, and leptoprosopia. After exertion perspiration was freer on the left half of face than on the right. The author considers this observation to speak against Körner's theory of the formation of a vaulted palate by interference of nasal respiration.
ZARNIKO.

183. A woman aged twenty-six years came to GRANT on July 14, 1898, on account of complete double nasal obstruction. The tip of the nose was hard and swollen, and the nostrils were completely blocked by a reddish growth of almost fibrous consistency. There were fine symmetrical scales on the soft palate, and the uvula had completely disappeared. The finger introduced into the naso-pharynx detected a firm dense bar extending horizontally across the lower margin of the posterior nares. The capsuled bacillus was found. CHEATLE.

184. After an elaborate discussion of the pathology of rhinoscleroma, FREEMAN reports a case of a man, æt. thirty-four, a native of Russia, who had suffered for three years from nasal obstruction with greenish discharges from both nares and considerable dryness. Both vestibules were contracted and blocked by a fibrous growth of great density. The septum was twisted and deformed, the choanæ were of about half the normal size. The posterior pharyngeal wall and trachea were covered with inspissated muco-pus. A penetrating, sickening odor of sweetish character was emitted. In the removed portions numerous bacilli of rhino-scleroma were found. M. TOEPLITZ.

g.—NASO-PHARYNX.

185. **Lichtwitz** and **Sabrazès.** Blood examination in children suffering from adenoids, before and after removal. *Arch. f. Laryngol.*, vol. x.

186. **Rethi.** Latent tuberculosis of the pharyngeal tonsil. *Wien. Klin. Rundschau*, No. 27, 1900.

187. **Eschweiler.** Late diphtheria in the naso-pharynx. *Münch. med. Wochensch.*, No. 17, 1900.

188. **Horne, W. Jobson.** Inflammation of crypts in the mucous membrane covering a defined recess in the roof of the naso-pharynx, giving rise to otalgia and other symptoms. *Proc. Laryng. Soc.*, London, May 5, 1900.

185. These authors investigated the question whether the malnutrition of children with adenoids was not associated with marked changes in the blood. They examined the blood of healthy children and of those with adenoids before and after

operation, with the following conclusions: with adenoids, a slight grade of anæmia and leucocytosis; increase of percentage and entire amount per cubic millimetre of the large mononuclear cells and especially of the lymphocytes and eosinophiles; a decrease of the relative and absolute relation of the neutrophile polynuclear cells. After removal of the adenoids the blood tends to become normal; the general condition and weight improve. The blood does not gain its physiologic characters progressively. Variations in the percentage of the leucocyte types appear, which probably depend on a number of uncertain quantities. ZARNIKO.

186. RETHI has observed 160 cases of primary latent tuberculosis of the pharyngeal tonsil where the body presented no other evidence of tuberculosis and the pharyngeal tonsil appeared not to be affected. The patients usually are from seven to seventeen years of age; in 76 the hereditary dyscrasia was present, in 58 the cervical glands were affected, scrofulous habitus in 14, and in two thirds the palatal tonsils were enlarged. The pharyngeal tonsil was generally enlarged and interfered with respiration in two thirds of the cases.

The most frequent deformity was a soft, tongue-like hypertrophy with glandular surface. In the histological examination Rethi found tubercles six times, caseation twice. The presence of tubercle bacilli in the epithelium was remarkable. The infection of the pharyngeal tonsil takes place from the tuberculous sputum, by the blood or lymph circulation, or by the inspired air. Enlargement of the gland increases the disposition to tubercular infection, another reason for removing every enlarged pharyngeal tonsil. POLLAK.

187. A week after the cure of the pharyngeal diphtheria, a diphtheritic membrane appears in the right nasal cavity, with discharge but no general symptoms. The membrane was easily removed with the curette without bleeding. Recovery after three days. A month later the brother of the little patient was taken ill with pharyngeal diphtheria. SCHEIBE.

188. A man aged twenty-five had three or four months complained of pain in the left ear with impairment of hearing. On examination there was nothing in the ear to account for the pain; but, by posterior rhinoscopy, small circular, sharply punched-out crypts or depressions were seen in the outermost parts of the roof of the naso-pharynx, directly above the cushion of the Eustachian orifice and the arch of the posterior nares; the one on the left

side contained pus and the edges were inflamed. Under treatment the symptoms disappeared. CHEATLE.

SOFT PALATE, PHARYNX, AND BUCCAL CAVITY.

189. **Pluder.** Two cases of extreme mobility of the tongue. *Arch. f. Laryng.*, vol. x.

190. **Suchannek.** Multiple appearance of sebaceous glands in the mucous membrane of the human mouth. *Münch. med. Wochensch.*, No. 17, 1900.

191. **Lack, H. Lambert.** A curtain-ring which was removed from the pharynx of a child. *Proc. Laryng. Soc.*, London, May 5, 1900.

192. **Tilley, Herbert.** A case of abnormal pulsating pharyngeal vessel. *Proc. Laryng. Soc.*, London, April, 1900.

189. Two very rare cases. Both patients were able to pass their tongue, after the fashion of the Indian fakirs, behind the uvula and touch all parts of the naso-pharynx ; and one could explore the laryngeal part of the pharynx. The cause, in one, seemed to have been hypochondriacal imaginations, in the other, inability to swallow hard lumps (œsophagismus). ZARNIKO.

190. In a man, forty-six years old, who had formerly suffered from pharyngitis and showed the evidences of atrophy of the pharyngeal and buccal mucous membranes, SUCHANNEK found yellow spots in the mucous membrane of the cheek opposite the upper molars which he regarded as calcareous mucous glands. Microscopically they proved to belong to the sebaceous glands.
HARTMANN.

191. A child aged nine years swallowed a ring at nine months. There was much choking at the time, but the symptoms passed off and fair health had been enjoyed, the child being brought to the hospital for adenoids. The ring was an ordinary brass curtain-ring, about one and one-half inches in diameter and about the thickness of a small Eustachian catheter. The upper part was free in the post-nasal space, the lower free in the lower pharynx behind the arytenoids, the sides being embedded beneath the mucous membrane of the lateral walls of the pharynx. Under chloroform the upper part of the ring was forcibly pulled forwards, and the lower part was with some difficulty cut through with bone forceps. The lower part was then pulled open by the fingers and extracted by pulling upwards. CHEATLE.

192. A girl aged six years, suffering from enlarged tonsils and adenoids, showed a large pulsating vessel, possibly an abnormal ascending pharyngeal artery, behind the right posterior pharyngeal pillar. CHEATLE.

EDITORIAL NOTICE.

The ARCHIVES OF OTOLOGY is a bi-monthly journal, published in annual volumes of about five hundred pages each, extensively illustrated with cuts in the text, half-tone text plates, and lithographic plates, many in colors.

About three quarters of the space is devoted to original papers, and the remaining quarter to a systematic report on the progress of otology, and to reports of societies, book reviews, and miscellaneous notes.

The papers and reports are original, and only accepted with the understanding that they are to be published in this journal exclusively. The original papers in the English edition appear in the German (*Archiv für Ohrenheilkunde*) either in full or in more or less abridged translations, and *vice versa*.

Any subscriber that wishes to refer to the original text of a translated or abridged paper may, by applying to the editor, obtain a reprint which, it is expected, he will return after perusal.

Original papers of value from any source are solicited.

Communications for the English edition of the ARCHIVES OF OTOLOGY should be addressed to DR. H. KNAPP, 26 West 40th Street, New York, or to DR. U. PRITCHARD, 26 Wimpole Street, W., London, England.

The subscription price of the ARCHIVES OF OTOLOGY is $4.00 per year, payable in advance. The price per number is 75 cents.

The ARCHIVES is sent postage free in the United States, Canada, and Mexico.

CONTENTS OF VOLUME XXX., NUMBER 2.

PAGE

1. Electrolysis in the Destruction of Organized Strictures of the Eustachian Tube. By **Joseph A. Kenefick,** M.D. 73

2. Acute Otitis Media, Cerebellar Abscess; Operation; Death from Meningitis. By **Wendell C. Phillips,** M.D. 85

3. Mastoiditis Complicated by Paralysis of External Rectus. By Dr. **Kaspar Pischel,** San Francisco, Cal. 91

4. Acute Mastoiditis, Thrombosis of Lateral Sinus, Perforation into Pharynx. By Dr. **Kaspar Pischel,** San Francisco, Cal. . . 93

5. Skin Flap for Immediate Closing of Wound in the Radical Mastoid Operation. By Dr. **Kaspar Pischel,** San Francisco, Cal. (With an illustration in text) 95

6. The Diagnosis and Treatment of Otitic Meningitis. By Dr. **Hinsberg,** of Breslau. Translated and Abridged by Dr. EDWIN M. COX, of New York 96

7. Primary Otitis Externa from a Clinical Point of View. By Dr. **C. J. M. Schmidt,** Odessa. Translated by Dr. C. MUND, New 112

ERRATUM.

The three illustrations for Dr. Preysing's article on page 127 should read

Plates V.–VII. of Vol. XXXVII.

12. Report on the Progress in Otology for the Third Quarter of 1900. By Dr. **A. Hartmann.** Translated by Dr. ARNOLD KNAPP . 164

13. Book Reviews 177

    I.—Rhinology, Laryngology, and Otology, and their Significance in General Medicine. By Dr. E. P. Friedrich, of Leipzig.

    II.—The Year-Book of the Nose, Throat, and Ear. Edited by Dr. G. P. Head and Dr. A. H. Andrews.

14. Miscellaneous Notes 178

VOL. XXX. No. 2.

ARCHIVES OF OTOLOGY.

ELECTROLYSIS IN THE DESTRUCTION OF ORGANIZED STRICTURES OF THE EUSTACHIAN TUBE.[1]

By JOSEPH A. KENEFICK, M.D.
ASSISTANT SURGEON NEW YORK EYE AND EAR INFIRMARY.

ELECTROLYSIS in the Eustachian tube was first used in 1888, by Cumberbach and W. S. Stevenson in London, and a report of their work favorable to the method appears in the *Lancet* for November of that year. Politzer simply mentions having used it in one case. In the *New York Medical Record* for December, 1898, Dr. Robert Newman of this city mentions having used it with good results. As the bougie electrodes used in London and also that of Newman are described as extending only one inch beyond the tip of the catheter, it is evident that one of the most important steps in the technique of this procedure must have been impossible, viz.: the introduction of the bougie into the tympanic cavity. In the *American Journal of the Medical Sciences* for April, 1900, a paper is published on this subject by Dr. Arthur B. Duel of this city, in which he reports a series of fifty cases, and concludes, after nearly three years' observations, that in restoring the patency of strictured Eustachian tubes, it is the most rapid and efficient of all known methods.

It is the purpose of the present writer to present roughly the histories of a few typical cases helped during last winter and spring, to report as far as possible on their present condition, and to bring up for discussion some points on the general subject which have occurred to him during his experience with this method.

---

[1] Read at the meeting of the Section on Otology, New York Academy of Medicine, January 9, 1901.

It is hardly necessary to go into the etiology and pathology of these strictures. You will recall that they are the result of inflammatory processes characterized in the beginning by hyperæmia and stasis, vascular non-resolution, then migration of round cells into the resulting exudate, and lastly, the organization of the latter into fibrous connective tissue. They may also occur as a result of the sclerotic form of inflammation which is characterized by the formation of cicatricial tissue from the beginning. They may be the result of inflammatory processes extending into the tube from pharynx or tympanum, or of processes occurring independently within the tube itself. In any case the inflammatory deposit may occur at one or several points in its course. Owing to the vascularity of its lining at the tympanic orifice, the tube is particularly likely to be occluded at this point, a fact demonstrated frequently in the manipulation of the electric bougie.

Within the tympanum the different forms of inflammatory products are described as hypertrophies of its lining membrane, and the formation of binding cords and bands, "strings and bridges" between its structures. It is evident that these may stand in the way of improvement even after patulous tubes have been established. It is evident also that when we come to study the effect of the negative electrode upon obstructing tissue within the tube we must also consider the possibility of similar effects within the tympanum.

The above then constitutes a general view of the conditions leading up to Eustachian stenosis with which we have to deal. It is easy to see how in victims of this condition, the well-known row of symptoms, deafness, tinnitus, vertigo, and all kinds of peculiar and distressing head sensations, may be produced, according to the duration and the degree of the stenosis and the extent to which it has disturbed the relationship along the line through tympanum and internal ear.

The early exudate may be expelled by persistent inflations, and the ordinary bougies may aid in the dissolution of freshly formed inflammatory tissue, but when we come to deal with the tough, leathery, non-vascular, resistant, and well seasoned obstruction, we meet with an unyielding front which gives way only when the entering bougie is made the negative pole of the battery. The writer would not be here understood as limiting the efficiency of this method to the latter form of obstruction, for he believes, in careful hands, good results may follow its use in fresh formations. Our experience has been, however, more with cases of long standing.

These old cases are those which have gone the rounds of the specialists and pseudo-specialists, and exhausted all the means of relief advertised in the newspapers and magazines.

The method of treatment was that originally advocated by Dr. Duel, and is familiar to most of you through the papers already published on this subject. Briefly, the instruments consist of an ordinary silver Eustachian catheter wound with rubber tissue for insulation. The bougie is of gold wire, with an olive tip one to two millimetres in diameter and of sufficient length to extend one and three quarters inches beyond the catheter tip. The Edison 110-volt current is usually available for this purpose, but must be under perfect control, with a volt selector and a milliampèremeter. The wire bougie is made the negative electrode, while the positive is the ordinary contact electrode held in the hand of the patient. With the catheter in good position, the bougie is passed through it into the Eustachian tube until the obstruction is met. Having selected the number of volts required, usually thirty to thirty-five, a current of one and one-half to three, four, or even five milliampères is turned on while the tip of the bougie is held firmly in contact with the obstruction. Within a fraction of a minute usually, sometimes longer, according to the extent of the stricture, the bougie passes through and is felt free in the space beyond. This process may be repeated several times before the bougie enters the tympanum.

It can readily be seen that with experience in this method, one ought to acquire a *tactus eruditus* which would enable him to *feel* the tube throughout its entire length, and judge the number and extent of the obstructions present. In the experience of the writer, as the bougie passes through, some feel short and annular, others long and even tubular, and these different forms may be felt close together or at widely different points, from the pharyngeal to the tympanic orifice. It is interesting to observe in this connection that in some cases presenting distinct signs of Eustachian stenosis the bougie passes freely to the tympanic orifice before it encounters the offending obstruction. On the other hand, the bougie may be arrested in the first quarter inch of its course and further progress be absolutely opposed, until we call the electric current to our aid, when the bougie passes freely through and goes all the way on to the tympanum without further difficulty.

Under these latter conditions of single strictures, especially of long standing, it is obvious that brilliant results are possible, provided the rest of the auditory apparatus is free. When the single stricture occurs at the tympanic orifice, we are liable to be misled in two ways, viz.: the length to which the bougie may enter and still be short of the tympanum, and the fact that, on account of the proximity of the obstruction to the otoscope, our inflations may sound exactly as if the air had entered the tympanum. In such cases we must be guided by experience, for we ought to know from the space between the bougie handle and the mouth of the catheter, that the distance to the tympanum has not been covered, and moreover we have not yet experienced the successive characteristic sensations felt as the bougie moves freely through the tympanic cavity and strikes against its wall. A little courage and persistence on the part of the operator at this point may save the whole process from failure and give to the patient his long-sought relief. The rule is, therefore, to enter the tympanum at the first sitting in every instance possible. Cases will, of course, be met with which will require more than one sitting in which to accomplish this.

The distress caused by this procedure differs in different individuals, and can be kept at a minimum by proper cocainization, proper management of the current, and the avoidance of severe pressure on the electrode. If the first administration is given with discretion and care, the patient, knowing later what to expect, usually accepts the others without hesitation. A slight feeling of soreness may follow, but usually disappears after an hour or so. Should the patient complain of soreness or pain in the throat, an incriminating kink can usually be found in the bougie, showing that it had been pushed down along the pharyngeal wall,—a process which may closely simulate its passage through the tube.

In cases of recent formation where the vascular conditions are favorable to reaction, a severe closure of the tube with aggravation of all symptoms may come on within the first twenty-four hours, but at the end of that time is usually followed by a clearing-up process, which, aided by inflations, progresses to marked improvement over the original condition. Where the formations are older and the tube lining less vascular, sharp reactions are obviously less likely to occur. The value of inflations for promoting the absorption and resolution of reactions and as a means of giving us knowledge of the exact conditions within the tube is inestimable and they should be practised on alternate days in the intervals between the electrolytic treatments. Before beginning treatment in any case, precaution should be taken to test the current connections and be absolutely sure of the polarity.

While this paper is written from a purely clinical point of view, it has occurred to the writer during his observations that the character of the current and its acceptability to the patient, especially in this region, are matters of sufficient importance to deserve attention. The writer is quite convinced that the chemically generated current is more acceptable than one from the dynamo, and that the central station current, after passing out over the mains, is much more acceptable than a dynamo current generated in the building where the patient is treated.

This process has been objected to as follows: First, that the bougie is crude, being without insulation, and therefore exerts equal electrolytic action at every point of its surface and that the walls of the tube must suffer in consequence. Second, that the use of the electrolytic process is likely to be followed by recontractions worse than the original, as is claimed to occur in the case of the urethra. Third, that the gold wire bougie electrode is used without exact knowledge of just what it does, and that its introduction into the tympanic cavity is dangerous and may be attended with harmful results. In reply to these objections it may be said, first, that while some current may pass at all points, we have no clinical evidence that there is electrolytic action anywhere excepting at the point of greatest contact, viz., at the olive tip of the bougie. If the current usually used should be confined to the area of this tip, its density would be so great at that point as to be absolutely intolerable in the Eustachian tube. This difficulty might possibly be overcome by reducing the voltage, but the efficiency may also be reduced by this latter procedure. It would seem then that a non-insulated Eustachian bougie, while it may leak harmlessly (and perhaps beneficially) at the sides, and be less scientific, is more acceptable to the patient, and possibly more efficient for our purpose. Second, that there should result re-contractions similar to those occurring in the urethra does not seem to me possible, as we are dealing with a non-collapsible tube free from any irritating agent like the gonococcus or the urine, and where the vascular conditions are not favorable for the reformation of stricture tissue after it is once destroyed. Third, while it is apparently possible that the introduction of the wire electrode into the middle ear may be attended with accidents, such as perforation of the drum membrane, dislocation of the ossicles, otitis, etc., none of these have occurred in the writer's experience, and he has no knowledge of their occurrence in any case. Moreover, with this bougie electrode the writer believes the operator should have a better knowledge of what he is doing than with any other in use.

In conclusion, then, the process of electrolysis is described in every book on electro-therapeutics, and in all, the quality is claimed for it of softening and promoting the reabsorption of inflammatory connective tissue, and its successful use is reported in cases ranging from stricture of the urethra to opacities of the cornea. With the exact electro-chemic phenomena occurring at the point of contact in living tissues it is not the purpose of this paper to deal, as it is presented from a purely clinical standpoint. From this point of view then the writer would venture to give his personal impression, viz., that as the bougie electrode is held against the obstruction and slowly passes through it, the process seems to the operator to be one of liquifaction and lubrication. The bougie having passed, its action becomes an electro-mechanical one, and apparently causes a softening of the main body of the stricture, a shrivelling of its superficial layers, and a process of vascular absorption which may go on for some time afterward.

The following cases were treated by my colleague, Doctor Brandegee, and myself during last winter and spring at the New York Eye and Ear Infirmary, in the clinic of Dr. Dench, to whom I am indebted for his constant courtesy and helpfulness. The cases were selected after a diagnosis of probable Eustachian obstruction was made out from the history, symptoms, physical examination, and otoscopic auscultation. Owing to interruption in service at the Infirmary, all the patients treated, upwards of forty, passed from observation in May last, and have since been without treatment. The following are the histories of some of those who returned in the fall and reported themselves as still enjoying the improvement experienced last winter.

CASE I.—Joseph B., fifty-five years old, specific twenty years ago, has been under treatment in this clinic for more than five years, but complained of constantly increasing deafness in his left ear, distressing tinnitus constant, and a sensation described as that of a wall shutting off his left ear. Inflation of the left tympanum was seldom or never accomplished to his satisfaction, although the otoscope conveyed the opposite impression to the operator, showing, as was afterwards demonstrated by the bougie, that the obstruction was at the tympanic orifice of the tube, and the patient's impression was the correct one. He was having frequent attacks of vertigo and he could no longer hear the ticking of his alarm clock when held close to the ear. Functional examination.—Upper tone limit, normal. Lower, 128. B C is slightly diminished and referred to the left side. Hears whisper at two feet. With the electric bougie two obstructions were encountered, one just within the pharyngeal orifice, and the other, most important, just at the tympanic orifice. He was bougied three times during the winter at intervals, with inflations between, and with constant improvement. He had practically no treatment during the summer, and only inflations in the fall. Last week, Jan. 4th, he heard as low as 32 (G, Dench fork), normally, whisper at thirty feet, tinnitus scarcely perceptible, and the wall sensation entirely gone.

Case 2.—Mrs. J., forty-six years old, came first to this clinic in December, 1898, complaining of deafness, extreme tinnitus, and vertigo with nausea, of nine months' duration. Her vertigo was now so severe that she never went about without an attendant. Functional examination December 7, 1898. Left ear: upper tone limit is 1.8 (Galton); lower, 64. B C (256), is slightly diminished. Whisper heard at four feet. *Mt.* dull and retracted. After three months of ordinary treatment, her left tube was bougied in March, 1899, with instant and permanent relief of the vertigo and marked improvement in the hearing. The tinnitus persisting, the patient persevered in the treatment in the hope of finally getting relief. She had six sittings during the last winter and spring, but the tinnitus, although changed in character, still persists. At present, Jan. 4, 1901, nearly two years since first treatment, and after nine months without any treatment whatever, she reports permanent relief from vertigo, tinnitus still persistent, and her whisper-hearing distance is now found to have increased from four feet to thirty feet. The relief from such a degree of vertigo, so prompt and permanent, is most remarkable.

Case 3.—Mrs. R., thirty years of age, came to the clinic in March, 1900, complaining of severe tinnitus in her left ear, of one and one-half years' standing. The impairment of hearing is unimportant in this case, although distinct signs of narrowing of the tube are heard with the otoscope. After four weeks of treatment by the ordinary methods, the electric bougie was applied. Stricture was encountered in the cartilaginous portion. Tinnitus ceased at once. December 28th, nine months afterward, she reports that she considers herself cured.

CASE 4.—J. L., forty-six years old, ship steward and grocery clerk, complained of deafness and extreme tinnitus in both ears. He describes the latter as loud buzzing mixed with mosquito sounds in the right, and as throbbing in the left. This followed the taking of large doses of quinine fifteen years ago, and has continued ever since to grow gradually worse. He has now lost his situation in the grocery store because of his difficulty and uncertainty in taking orders. Functional examination, October 9, 1899. Right ear: upper limit, 2 (Galton); lower limit, 128; whisper, one foot; B C increased. *Mt.* dull and retracted, with marginal congestion; tube narrowed. Left ear: upper tone limit, 1.9; lower, 128; whisper, 5 feet; B C increased; *Mt.* dull and retracted; tube narrowed. After four weeks' treatment by the ordinary methods, he was bougied electrically in November, December, and January, once in each month, with the usual inflation between treatments. On February 8, 1900, test shows that his whisper distance has increased from one foot to thirty feet, while his lower limit has gone from 128 to 64 in the right ear, and in the left ear his whisper distance has increased from six feet to thirty feet, and the lower limit has gone from 128 to 32. His tinnitus has practically disappeared. Although without any treatment whatever since May last, his test last week is the same as that of last February, given above, and his improvement is apparently permanent. He resumed his occupation in the grocery store and gives satisfactory service to his employers.

CASE 5.—F. B., butcher's clerk, came to the clinic October 29, 1899. For five years he had been growing gradually deaf, with increasing tinnitus, until now he was about to lose his position because the customers were obliged to shout their orders into his ear, and he was unable to use the telephone. Functional examination—Right ear: upper limit, 3; lower, 128; whisper and acoumeter, 0; ordinary voice, 6 inches; *Mt.* dull and retracted; tube markedly narrowed. Left ear: upper limit, 3; lower, 128; whisper and acoumeter, 0; ordinary voice, 2 feet; *Mt.* dull and retracted, and tube distinctly narrowed. Between October 17 and February 14, 1900, the right ear was bougied three times, and the left once. On the latter date his test showed that his lower limit had gone from 128 to 32 on both sides, his hearing distance for whisper had increased from zero to thirty feet in both ears, his tinnitus has become scarcely perceptible, and he declared that he is constantly improving. One week ago, on January 4, 1901, almost a year after treatment, his test shows the improvement of February last to be permanent, and he assures us that he now not only hears at the telephone as well as the next one, but that he can distinguish and recognize the different voices of those with whom he does business in that way. He has had no treatment whatever since February last.

CASE 6.—S. G., produce dealer, fifty-six years old, came to this clinic December 18, 1900, complaining of deafness and tinnitus progressive during the last seven years. He has been obliged to retire from business, and complains bitterly of his tinnitus. Functional examination—Right ear: upper tone limit, 2.8; lower, 512; acoumeter, on contact only; whisper, at 2 inches; B C (512 fork) diminished, tube narrowed, and *Mt.* strongly retracted. Left ear: upper limit, 2.6; lower, 512; acoumeter, on contact; whisper, at 14 inches; B C (512) diminished, *Mt.* strongly retracted, and tube narrowed. He has been bougied three times up to March 24, 1900, since which date he has been without any treatment whatever. One week ago, nine months after, his lower limit has gone in the right ear to 64, distance for forced whisper to three feet. In the left ear the low limit is now 64, forced whisper heard at five feet; other tests unchanged. To quote his own words: "The bird singing, mosquitoes, and all that kind of business is all stopped now; I don't have that any more."

Having considered the action of the bougie electrode in its course through the tube we must consider the possibility of a similar action within the tympanic cavity. This possibility suggested itself to my colleague, Dr. McKernon, who has kindly given me the notes of two typical cases from a series of twenty or more in his private practice. It will be noticed that in these cases no Eustachian obstruction was present and the results follow the introduction of the negative pole into the tympanun for periods not exceeding three minutes at each sitting.

CASE 1.—A woman, fifty-four years of age, complained of progressive tinnitus and deafness for fifteen years. Functional examination—Right ear: upper tone limit, 2; lower, 256, whisper distance, 4 feet; *Mt* thin and transparent; and tube admits large volume of air. Left ear: upper tone limit, 2.4; lower, 256; whisper distance, 6 inches; *Mt* thin and transparent; tube admits a large volume of air. The bougie was introduced into the right tympanum, and contact was made for three minutes, with three milliamperes at thirty volts. The left ear was similarly treated on the day following. Four days after the last treatment the test is as follows—Right ear: upper limit is unchanged; lower limit, 128; whisper, now at 22 feet. Left ear: upper limit, unchanged; lower 32, and whisper now heard at 8 feet. Tinnitus has entirely disappeared. At present (seven months after) the test remains the same and the patient declares she has no tinnitus.

Case 2.—Woman, sixty-two years old, has complained of deafness and distressing tinnitus progressive during the last eighteen years. Functional examination—Right ear: upper tone limit, 2.1; lower, 64; whisper heard at 4 feet, *Mt* thin and transparent, and tube widely open. Left ear: upper limit, 2.5; lower, 64; whisper heard at 6 inches; *Mt* thin and transparent, and tube widely open. Treatment was the same as in Case 1. Immediately after treatment the test was as follows—Right ear: upper limit, 2.1; lower, 26; whisper, 22 feet. Left ear: upper limit, 2.5; lower, 32; whisper, 6 feet. Ten days later the patient was again tested and the whisper was now heard in the right ear at 32 feet and in the left at 11 feet. At present, seven months after, the functional improvement remains the same as at the last test, the tinnitus has entirely ceased in the left ear and is only occasional in the right.

The writer has had no experience in this class of cases, nor can he or his colleagues give any explanation of the process of relief farther than to reason from the electrolytic action in the Eustachian tube. As has been said, it is possible that the action of the electrode in the tympanum may be one of softening and disintegrating the inflammatory products there, and thus producing such changes in tension and the relations between tympanum and labyrinth as to overcome largely the functional embarrassment of inflammatory origin. This class of cases must receive further study later.

Briefly, then, in closing, the writer would offer the following conclusions: (1) That it cannot be foretold exactly in any given case just what result will follow this treatment, as this will depend largely on two comparatively unknown quantities, viz: (*a*) the vascularity of the tube lining and its toleration of the mechanical and electrical interference, and (*b*) on the degree of tympanic involvement. (2) That tubal obstruction is early present in the great majority of cases of so called chronic hypertrophic catarrhal otitis media, and that progressive deafness, tinnitus, and vertigo, and many of the peculiar and distressing head symptoms may be purely mechanical, dependent upon closure of the tube by an organized obstruction, while the tympanum and its structures are yet free or only slightly involved. Under the latter circumstances brilliant results may follow restoration of the tube's patency. (3) That in any case where Eustachian obstruction has become organized the best means of disintegrating and causing its reabsorption is by the electrolytic bougie, which in rapidity, efficiency, and permanency excels all known methods.

ACUTE OTITIS MEDIA, CEREBELLAR ABSCESS; OPERATION. DEATH FROM MENINGITIS.[1]

By WENDELL C. PHILLIPS, M.D.,

AURAL SURGEON TO THE MANHATTAN EYE AND EAR HOSPITAL.

F. S., age 21, single, came to my clinic at the N.Y. Post Graduate Medical School and Hospital February 19, 1900. Family history negative. Had scarlet fever when seven years of age, otherwise in good health. Had good physique. About three weeks previously had suffered from an attack of grip, followed in one week by severe pain in the left ear, which began to discharge after two days.

When first seen he had a profuse discharge from the left ear, with a large perforation in the drum. Two days later, at a second visit to the clinic, the region about the mastoid process had become slightly painful on pressure. He was that day admitted to the hospital ward. He did not seem to be at all ill but for a slight pain about the ear. There was no external redness or swelling. Two leeches were applied to the mastoid bone and considerable blood allowed to flow after the leeches came off. Temperature 99.6°, pulse 80, respiration 20. He passed a very comfortable night, and on the second day a microscopical examination of the pus revealed the presence of streptococci and indefinite diplococci. Hot flaxseed poultices were kept on continuously and the ear was irrigated with hot sterilized boric-acid solution every two hours. Calomel was also administered. There was no pain, but the discharge was still profuse; slight tenderness on pressure over the antrum continued. Urinary analysis was negative. On the 23d, the temperature, pulse, and respiration were normal; no pain. He complained of no pain, the discharge was free, and the hot-water irrigation was continued. He seemed to be improving, although there was still some pain on pressure over the antrum and tip. On the 6th day of March it was noted that the discharge was streaked with blood.

---

[1] Read at the meeting of the Section on Otology, N. Y. Academy of Medicine, Feb. 13, 1901.

On March 7th, there was slight bulging in the attic region and the discharge was considerable. Temperature that day at 2 P.M. was 100°. On account of the continued tenderness it was decided best to no longer delay the operation. On March 8th, the temperature was 99° in the morning, but by 11.30 P.M. it was 103°, pulse 104. Slept well, and on the 9th at 9 A.M. Dr. Clemens operated, as I was called out of town.

OPERATION: Pus was found diffused over a considerable area beneath the periosteum and the bone was of a bluish color. There were three very small perforations through the cortex posterior to the antrum. The entire cortex was removed, the walls of the cells were broken down. The whole area of the mastoid was involved. The lateral sinus was exposed to a considerable area in both directions, especially from the knee backwards. There was no sign of pulsation. The antrum contained a small amount of pus, and was carefully curetted and drainage was established. An aspirating needle was passed into the lateral sinus upward and downward, but no blood could be withdrawn. An incision three quarters of an inch in length was now made into the lateral sinus. A profuse flow of blood followed from the upper end. After a brief effort to release any clot from below, the opening was closed with a plug of gauze and the remainder of the wound packed.

The patient returned to the ward in good condition. Later in the day he complained of some pain in the head; was given 6 m. of Magendie's solution of morphine by hypodermic. He passed a fairly comfortable night and the following morning his temperature was 99.4°, pulse 68, respiration 20.

March 11th.—Slept well, fluid diet. T. 100°, P. 96, R. 20.

March 12th.—Slept well, T. 99°, P. 92, R. 20; no discharge from the ear.

March 13th.—Condition the same; the dressings were reinforced.

March 14th.—Dressings were changed by Dr. Clemens.

March 15th.—Slept well; during the day complained of some headache; gave codeia and phenacetin, also cathartic. Headache was localized in frontal region.

March 16th.—Slept well; T. at 6 A.M., 98°, P. 60, R. 16. Wound dressed.

At 6 P.M. on March 16th he vomited milk curds, and later a greenish fluid. At midnight the T. was 98°, P. 58, R. 11; slept well, but wakened with pain at times; some nausea and hiccough. During the night he vomited an eight-inch worm.

March 17th.—Mastoid dressed. Some pus on the surface of the wound, but no pocketing; had slept well, with no vomiting; but little pain; somewhat listless and refused milk. Dr. Valk examined the eyes and reported "no evidence of choked disc; the optic nerves were somewhat hyperæmic, especially the left."

March 18th.—Gave calomel. The patient had severe toothache, which masked other symptoms.

March 19th.—Slept quietly during the night. At 6 A.M., T. 100°, P. 78, R. 11.

During the forenoon of March 19th, passed into a state of coma and could not be aroused. In the afternoon he would occasionally cry out and was momentarily conscious. Dr. Valk examined eyes again, reported that the eye-grounds were normal. Respiration remained slow. At this time I was again away from the city for two days. Dr. Clemens saw him in the afternoon and considered the case at that time inoperable. The temperature was higher. At 10 P.M., T. 100.4°, P. 112, R. 22. The following morning at 6 A.M., T. 105.8°, P. 118, R. 12. He was unconscious except at very short intervals. Urinary examination showed a slight trace of albumin and a few small granular and hyaline casts.

March 21st I saw him again. He was semi-conscious, restless, and noisy. T. 102°, P. 99, R. 24. Examination of the eyes showed the same conditions as previously. I went prepared to operate if there should seem to be any reason for so doing.

Upon removing the dressing I found considerable pus upon the surface of the sinus posterior to the knee. After removing the pus I probed the surface, and to my astonishment the probe passed inward and slightly upward 3½ inches from the external table. Upon removing the probe, pus flowed freely. I then took a bistoury and enlarged this opening, which of course was directly through the walls of the sinus into the cerebral cavity. Finding that this gave him almost no pain, I decided to proceed without an anæsthetic and consequently made a free opening. The depth of the abscess, together with the direction taken by the probe, forced me to the conclusion that I must be passing directly into the cerebellum. The abscess seemed to be walled in, as the probe could not be passed in any direction except directly inwards. I injected a free quantity of peroxide of hydrogen, diluted one half, with a large syringe into the abscess cavity. Previous to this, however, about three drachms of creamy pus had escaped. The injection was not followed by actual pain, but it did cause severe hiccough for about one minute. After completely cleaning the abscess I gently curetted, especially at the orifice, and then inserted a long rubber drainage tube to the bottom of the wound, pinning the outer end of the dressings.

Following this treatment the patient became much improved. T. 98.8°, P. 88, R. 18. He slept all night and remained conscious. The external dressings were changed every four hours, even during the night, and the abscess irrigated through the tube with a fifty per cent. solution of hydrogen peroxide and followed by further irrigation with sterilized solution of boric acid. The morning report was that the patient stood this treatment well, except that he hiccoughed a few times at the injection of boric acid. During the 23d and 24th he remained conscious and in good condition. The irrigation was kept up every four hours. At one treatment he vomited a little and hiccoughed at every treatment. On the morning of the 24th T. 99°, P. 98, R. 19. On the 25th we began to notice that the tube was pushed out about one half inch at each dressing. At this time the examination of the urine showed a few hyaline casts and a few leucocytes. On the 26th, 27th, and 28th, condition remained the same. On the 29th he became quite noisy and did not take nourishment well, complained of pain in the legs, but he had no perceptible rise of temperature. Was given codeia and bicarbonate of soda. On the 30th was examined by Drs. Collins and Hammond, who gave an opinion that he had a septic phlebitis in the leg ; this gave him but little trouble, except when he attempted to move it. On the 31st he was much brighter, with improved appetite, although the leg was somewhat painful on motion. There was no external swelling in the leg. On the 1st of April the leg was much improved; mind clear. Patient laughed and joked and begged for cigarettes. Wound seemed to be closing in. T. 99°, P. 96, R. 18. April 2d, 3d, and 4th, continued to improve. Noted on April 5th that the external opening was rapidly closing. Patient begins to sit up in bed and to take nourishment freely. On the 10th he sat up in a wheel chair, wheeling himself about the ward. On the 13th began tonics of strychnine and hemabaloids. No change up to the 19th. Was eating well and sat up all day. He walked considerably, although the left leg was still somewhat painful. On the 20th, tube was removed and used gauze packings.

On the 2d of May we began using moist dressings. Abscess cavity was rapidly filling in. Patient expressed himself as feeling perfectly well—no pain, no fever, walked about the hospital freely and was out of doors daily. This improvement continued, and on the 18th I made a careful physical examination and also examined the wound with great care. At that time I considered him to be a well man physically; the wound was nearly healed, and a probe could only be passed through into the abscess cavity, which discharged almost no pus, and the slight amount which did come seemed healthy in character. I felt that I had kept him in the ward considerably beyond the usual time for keeping these patients. My anxiety to take every precaution to save the case impelled me to do so.

He was discharged on this day and directed to return daily for his treatment and was told that he could resume his work at an early date. He returned daily for his treatment and the reports came to me that his improvement was marked. This improvement continued until the 25th, when he was seized suddenly with a violent headache and persistent vomiting, the headache being mostly frontal. His friends told me that he had eaten immoderately the previous day. His suffering was so severe that he screamed constantly. At 9.30 A.M. on the 26th he was readmitted to the Post-Graduate Hospital; T. 98°, P. 64, R. 18; gave him calomel and codeia. He had almost persistent vomiting. I saw him at 5 P.M. I reinserted the drainage tube as far as I could and irrigated but found no pus. The patient was screaming with pain and rolled about the bed and vomited frequently a bright green fluid. Dr. Peck examined his eyes and the report was negative. At midnight the T. 99°, P. 60, R. 20. Even with hypodermic of morphine his pain could not be controlled. He was semi-conscious during the earlier part of the night and kept the ward awake the entire night. Early in the morning of the 27th I went to the hospital prepared to operate provided there should seem any reasonable indication for operative interference. The early morning temperature was 99°, P. 50, R. 16. Upon my arrival at the hospital I found that he had suddenly gone into a state of coma and died.

AUTOPSY, May 27, 1900, by Dr. Henry T. Brooks: On removing the calvarium the dura was found to be slightly adherent along the mesial borders of the hemispheres. The whole external surface of both hemispheres was covered in rounded areas with purulent exudates measuring about 2½ *cm* in breadth. On removing the brain, an orifice, about 1 *cm* in diameter, was seen in the base of the skull on the left side at a point corresponding to the mastoid process. This orifice communicated externally with the wound of the mastoid bone and internally a probe passed through the orifice was found to enter the left lateral lobe of the cerebellum. There was at this time no abscess cavity, but an opening remained large enough to introduce a probe. An incision was made into the cerebellum at a point opposite the opening in the skull which exposed an irregular blood-stained area, extending inward about 2 *cm.*

Microscopic examination of the brain tissue from the posterior portion of the cerebellum opposite the perforation in the bone showed nothing but meningeal infiltration with polymorphonuclear leucocytes. The brain tissue beneath this inflammatory area showed diffuse softening, an irregular area of translucent homogeneous tissue.

Cocci were found in the meningeal exudate. A more extensive examination of the brain tissue showed, in preparations just completed, innumerable streptococci in the depth of the brain substance. These micro-organisms were without much doubt streptococci pyogenes.

MASTOIDITIS COMPLICATED BY PARALYSIS OF EXTERNAL RECTUS.

By Dr. KASPAR PISCHEL, San Francisco, Cal.

W. G., thirty-four years old. Four months ago, abscess in both ears; right broke, left was opened. Feels as if right ear was going to have another abscess.

Hearing: R E, watch, 0.04 *m;* whisper, 3 *m;* voice, 75 *m.* L E, watch, 2 *m;* whisper, 75 *m.*

Right ear—catheter, moist râles; drum: no reflex, not swollen. Diagnosis: otitis media chronic of right ear. Treatment: inflations through catheter.

During the first week the hearing improved somewhat. Watch, 0.20 *m;* whisper, 3.5 *m.*

On the 13th day, however, patient complained of pain in right side of head. Some swelling in front of ear. Mastoid slightly sensitive to pressure. Drum bulging out. Temperature, 100°. Paracentesis membranæ tympani.

15th day.—Mastoid only slightly sensitive to pressure, just noticeable œdema; from paracentesis wound, muco-purulent discharge; temperature at 2 P. M., 99.8°.

16th day.—Evening temperature, 100°.

17th day.—Patient complains that he sees double since yesterday. Paralysis of external rectus. Right eye can be moved out only slightly beyond centre; fundus, veins somewhat congested. Pulse, 2 P. M., 102, temperature, 101.3°.

At 4 P. M., *Operation:* Mastoid cells only congested, very small; antrum full of pus; opening of middle fossa above antrum and attic to the extent of about ½ inch by ¾ inch. Iodoform gauze; bandage.

During the next nine days the fever gradually went down to 99.2°. Then it rose again gradually so that about seventeen days after the operation it was normal. During the next weeks however the temperature would always rise again to 100° at intervals of a few days. Forty-one days after operation, patient again had temperature 100°, and the communication with middle ear had been closed for a few days. As a little pus always came from depth of mastoid wound, the latter was enlarged under chloroform, the whole mastoid process removed, and the sinus exposed. When scraping out a very deep-seated cell with spoon a profuse hemorrhage occurred, which was stopped with iodoform gauze.

About four months after first operation, the hearing was: Watch, 0.15 *m;* whisper, 75 *m.* Patient still saw double from 45° temp. to 90° temp. of right side. Hyperphoria of right eye, 3°; esophoria, 12°. Seventeen months after operation the hearing was: watch, 40 *m;* whisper, 75 *m;* the vision: R. eye :—5 ○ cyl. —0.75, 75° N. $\frac{6}{6}$; L. eye : —5 ○ cyl.—0.25 H. $\frac{6}{6}$. R hyperphoria, 1°; no horizontal deviation.

Eight months after the first operation some small cells of the mastoid containing pus had to be scraped out. The microscopical examination by Dr. Ph. K. Brown revealed staphylococcus pyogenes albus. A few weeks afterwards wound was closed.

ACUTE MASTOIDITIS, THROMBOSIS OF LATERAL SINUS, PERFORATION INTO PHARYNX.

By Dr. KASPAR PISCHEL, San Francisco, Cal.

J. B., twenty years old, came to my office April 21, 1898, for treatment of right ear, giving the following history: About a year ago abscess in right ear; three weeks ago again, ear discharging for about a week. For the past ten days, with exception of the last three days, pain behind right ear.

Status præsens: Left ear, hearing: watch, 2 *m;* whisper, 4 *m;* voice, 75 *m.* Right ear, hearing: watch, 0.60 *m;* whisper, 4 *m;* voice, 75 *m.* Drum slightly bulging, injected.

Diagnosis: Otitis media catarrhalis aur. dext.

Treatment: Catheter.

Three weeks later: Hearing: L E, watch, 3 *m;* whisper, 75 *m.* R E: watch, 0.70 *m;* whisper, 75 *m.*

Six months later: L E: watch, 5 *m;* whisper, 75 *m.* R E: watch, 1 *m;* whisper, 75 *m.*

As the right faucial tonsil was decidedly enlarged, this was removed by electro-cautery seven months after his first visit.

August 1, 1900.—Patient and his mother were accompanied to my office by their physician who furnished the following data: five weeks ago both had severe cold and earache with fever. (I operated upon the mother at once for left mastoiditis with uneventful recovery.) Right ear of son discharged until five days previous to my seeing him. The morning of his visit there was again a bloody discharge. During last week had several chills, severe pain in right ear; fever: mornings, 101°; evenings, 102°.

After cleaning out external ear, which was filled with matter, I found drum bulging out, thickened; therefore paracentesis; a large quantity of sticky matter escaped. There was no sensitiveness or swelling of mastoid region; but patient had difficulty in opening his mouth. Temperature 104° ; next day afternoon temperature 99.2°. The third day, 7 P.M., patient had chills ; temperature 104.8°, swelling on tip of mastoid and below ; œdema of soft palate ; could not open his mouth ; from right ear copious discharge of yellow-brownish, thick matter with "Siegel" apparently not through drum, which was bulging out, but from in front of it where anterior wall showed a yellow spot, like perforation. Neuritis optica existed on both sides ; borders of disc not clear, moderately swollen, veins quite full, all vessels tortuous. At 10 P.M., *operation.* T-shaped cut along sinus, clearing tip. After removal of a few layers of cortex brownish pus streamed out in great quantity. Probe showed large hole over 1 *cm ;* curetting ; considerable bleeding. After removing overhanging bone, sinus lay open, filled with yellowish thrombus which I scooped out. Iodoform gauze.

Four days later : Dressing ; from jugular fossa copious pus discharge ; washed out with peroxide. Pressure in region of internal jugular vein brought more discharge.

Six days after operation : Ligature of internal jugular vein which appeared somewhat grayish but contained fluid blood. Large swollen gland just in front of vein removed.

Next day : Could open mouth better than before ; no pain in throat ; lower wound looked well ; very little discharge from upper wound ; when syringing jugular bulb fluid enters throat. The following day no longer any communication with throat, and two days later lower wound closed by first intention. Uneventful recovery.

Two months after operation the hearing was : Watch, 1.25 *m ;* whisper, 75 *m.*

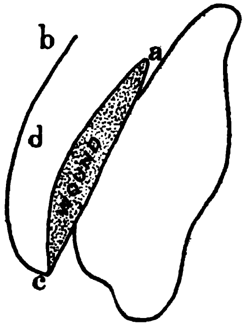
Three weeks after operation the vision on both sides was < $\frac{5}{6}$; field normal ; eleven weeks after operation sight was < $\frac{5}{5}$. While the disc of right eye had become nearly normal a month after operation, the disc of left eye still remains considerably swollen eleven months after operation.

SKIN FLAP FOR IMMEDIATE CLOSING OF WOUND IN THE RADICAL MASTOID OPERATION.

By Dr. KASPAR PISCHEL, San Francisco, Cal.

(With illustration in text.)

IN radical operations for chronic suppuration of the middle ear, if one wants to close the wound right away, I would like to suggest the use of a flap which served me well in the two cases tried. In several cases I used as a flap the skin between the wound and the border of the hair, which flap was laid in the mastoid trough created by the operation. If the flap had the base on top, it covered the roof of the mastoid wound. If the base was below, it covered the posterior wall adjoining the flap made by the external meatus. The permanent opening which was thus created was closed later by freshening the margin of the skin surrounding the hole, and stitching it together. In two cases, to avoid the permanent opening behind, I used the following method: flap *a c b* was formed out of the skin behind the wound; on the upper part of this flap *a d b* the superficial layers of the skin were removed and the wound closed so that *c* lay in the attic; *a* united with skin behind *b*, so that *a d b* rested on the flesh of the anterior border of the wound and united with it. If the epithelium had not been removed union could not have taken place.



THE DIAGNOSIS AND TREATMENT OF OTITIC MENINGITIS.

BY DR. HINSBERG, OF BRESLAU.

Translated and Abridged by Dr. EDWIN M. COX, of New York.

OF all intracranial conditions, meningitis offers the most unfavorable prognosis, but it is not certain whether this is so on account of the normally fatal intrinsic qualities of the disease, or because our knowledge and resources are not yet sufficient to cope with the disease properly. Upon this aspect of the question much has been written in the past few years, and there is still much in doubt. I should like to offer a few cases bearing upon this question, some of which I observed in the Poliklinik, and others I publish with the permission of Dr. von Mikulicz-Radecki.

The normal structure of the membranes of the brain is well known and need only be referred to (Axel Key, Retzius, Gegenbauer).

The subdural space lies between the endothelium of the dura and the outer layer of the arachnoid. The subarachnoid space forms practically a system of communicating lymph vessels, which are the most important channels for the dissemination of infection. The loose subarachnoid tissue is the most frequent seat of the form of suppuration with which we are dealing, though, in rare instances, pus may collect in the subdural space. This depends on the presence of adhesions between the dura and arachnoid, which are formed usually in chronic inflammatory processes in the immediate neighborhood, and are absent when the dura is suddenly perforated. The extension of the suppurative process may be diffuse over any part of the cerebral surface, or we may find circumscribed collections of pus in the subdural space and in the interstices of the arachnoid. Sometimes the superficial part of the brain is eroded. Macewen[1] mentions four such cases. Autopsy may show that such circumscribed collections may be the later starting-point of a diffuse meningitis.

Brieger calls this form of meningitis "chronic intermittent," and considers it of considerable importance. He gives two illustrative cases which are worth quoting. "The first patient was a man who had had headache for about two years with cholesteatoma of the temporal bone. The pain varied, and there were occasional somnolent periods combined with convulsive movements. Meningitis followed operation, and autopsy showed that the labyrinth was the starting-point of the infection, and that there were many old lesions particularly in the pia of the cerebellum." "The second case was that of a man who had had chronic discharge from the ear, and was subject to repeated attacks of intracranial inflammation, sometimes like brain abscess, and sometimes like sinus thrombosis. The patient was observed for two weeks, during which he complained of pain in the back and head, but had no objective signs of meningitis. At the end of this period he began to have fever, stiffness of the neck and mental dulness, and died in twenty-four hours. Autopsy showed old thickenings in the pia of the middle and posterior cerebral fossæ, adhesions to the dura, and a recent spinal meningitis. The labyrinth was the starting-point of the infection."

Von Bergmann[2] once found the staphylococcus albus in the cerebro-spinal fluid of a patient operated on for porencephalus, and the patient recovered, so that v. Bergmann considers that this form of bacterium does not necessarily cause a fatal meningitis. The exact behavior of others is still undecided. Gradenigo mentions two cases with staphylococci in the cerebro-spinal fluid, and I have seen one similar case which recovered. We may agree with Oppenheim that suppurative meningitis is not a disease of one type, and that the character of the infecting micro-organism makes a difference in the course and prognosis. Leutert believes that virulent bacteria cause diffuse meningitis when they penetrate the dura, and ascribes the circumscribed abscesses to a diminution in virulence in the infecting organisms, from decrease in number or power. The condition is analogous to what is seen in the peritoneum, which we know can dispose of infectious material up to a certain point, and this is important in deciding whether it is worth while to remove the primary focus in order to influence favorably the course of an already present meningitis. If we could draw trustworthy conclusions from clinical symptoms as to the extent and character of the anatomical conditions, we should have gained much in the way of therapeutics. We can do this in advanced cases where the meningitis is diffuse, but it is then too late, and we must therefore try to advance our knowledge of the beginning and circumscribed forms of the disease. Oppenheim calls attention to cases associated with otitis media and circumscribed areas of meningitis in the posterior fossa and in the spinal canal. In such instances, the spinal symptoms are most marked. In a case mentioned by Jansen and Oppenheim, with meningitis of the lumbar cord, the only symptoms were anal pain and incontinence of urine and fæces. When there are circumscribed areas of meningitis over the cerebellum all characteristic signs may be absent, though the diagnosis may be made by exclusion. We may cite the following case:

---

[1] "Die infectiös-eitrigen Erkrank. d. Gehirns." Deutsch übersetzt von Rudloff, 1898.

[2] "Die Chirurg. Behandlung von Hirnkrankheiten," 1899.

R. S., aged nineteen. Has had discharge from ears for a long time, and during a period of observation had remittent fever and dizziness, especially in the morning. October, 1899, right auditory canal filled with granulations and a fistula on the left side in the recessus epitympanicus leading upward. Dizziness persists.

Dec. 2d.—Operation showed right mastoid cells, antrum and tympanum full of granulations, and near the horizontal semicircular canal a shallow depression. The dizziness ceased and the temperature fell after operation, but the latter soon rose again. There were no signs of an intracranial complication.

Dec. 12th.—The above mentioned fistula was followed into the vestibulum, and freely opened. The dura over cerebellum laid bare, seemed unchanged. Temperature fell after this procedure but rose again in two days, though the only complaint made was of pain in the gluteal region. Two days later the cochlea which was necrotic was removed and the cavity scraped, this process bringing the bottom of the wound almost to the internal auditory meatus. Puncture of sinus and cerebellum negative. Examination soon after this showed bilateral choked disk.

Jan. 3d.—Complained of severe pain in sacral region.

Jan. 5th.—Very restless.

Jan. 6th.—Began to be somnolent and have stiffness of neck and later had sudden collapse with fatal result.

Autopsy showed an old area of meningitis near the internal auditory meatus, and diffuse suppurative leptomeningitis.

In this patient, after extensive exposure of the diseased area in the mastoid, intracranial symptoms (choked.disk) persisted, and since sinus phlebitis and brain abscess were sought in vain, the signs must have been those of a meningitis which, in absence of signs of extensive infection, must have been circumscribed. In the hope that the suspected focus near the internal meatus would heal after operation, no further attempt at operative work was made, and this plan seemed to be successful until at the end of two weeks meningitis suddenly developed and proved fatal in twelve hours. The result of the autopsy is mentioned above.

The fact that choked disk persisted without other signs of intracranial trouble of any kind was of assistance in making a diagnosis.

In another case, severe headache for days and then suddenly the signs of diffuse meningitis, fatal in twenty-four hours, were the signs. The history of the case is as follows:

W., æt. forty-two, had acute left otitis media; operation one month after beginning of illness; antrum exposed by operation, and one month later the mastoid cells were opened and the sinus and the dura exposed to a considerable extent. They seemed normal. The sinus was injured and the wound had to be packed. The headache gradually got better and the wound progressed favorably until it was reduced to a small fistula. Soon patient began to have drawing sensations on the left side of the head. Eyes normal. While he was returning home one evening, he began to have vomiting and severe headache, and his temperature rose to 37.5° C. He lost flesh, had vomiting, and sometimes a chill. Pulse, 70.

A diagnosis of brain abscess was made. Operation did not show such a condition, and the patient died delirious in a few hours.

Autopsy showed a purulent thrombus at the point where the sinus was wounded, and there was a small gangrenous spot in its wall which was the starting-point of a diffuse leptomeningitis.

Lucae (*Berlin. klin. Woch.*, 1899, No. 23) has reported a case of otitic disease in which a diagnosis of beginning meningitis was made, and an operation done. The dura was found greenish in color with a gangrenous spot, and some pus was evacuated. Incision to a depth of 1.5 *cm* into the brain substance did not disclose any more pus. The patient slowly recovered.

Jansen in the same journal (1895, No. 35) mentions a case in which it was impossible to say whether meningitis or cortical abscess was present. The patient had had discharge from the ear for years, and suddenly became ill with chill, delirium, and pain when the head was moved. There was also sensory aphasia. Temp. 38.2°. A tentative diagnosis of extradural abscess in the posterior fossa with abscess in the upper posterior part of the left temporal lobe was made and an operation was done. The brain was punctured through the dura and no abscess discovered, but a drop of pus escaped from the needle puncture in the dura, which was then incised. The dura and pia were adherent and discolored. Incision into the temporal lobe was negative, and the patient recovered.

In this case the aphasia pointed towards a cortical lesion which could have been caused by a collection of pus on the cortex or by the pressure of an extradural collection. The stiffness of the neck did not necessarily mean meningitis, but might have been caused by an extradural abscess in the posterior fossa. According to Oppenheim, focal symptoms are not uncommon in cases of circumscribed meningitis, but signs of involvement of the internal capsule and the optic tract do not occur as in the presence of intracerebral abscess. Pressure symptoms may be present and signs of meningeal irritation are usually not marked. The type of temperature and pulse according to the same author is intermediate to that in abscess and diffuse meningitis. In Macewen's cases of subdural abscess cited above, there were distinct symptoms of meningitis, high temperature, beginning opisthotonos, photophobia, and marked irritability.

The same writer has mentioned also six cases with distinct meningeal symptoms in which operation showed conditions which made him believe that there was circumscribed leptomeningitis.

In a case which we saw there were meningeal signs, and a jugular phlebitis complicated the diagnosis. Lumbar puncture before operation showed diplococci. The following clinical history is of interest:

S. F., æt. thirteen. Admitted July 24, 1899. At age of six had measles, followed by discharge from right ear. In March, 1899, reported that five days previously he began to vomit, had headache, and beginning stiffness in the neck, and was mentally dull. At present, pulse 126, temp. 39.2°, sensorium clear, face flushed ; has herpes labialis. The right mastoid is tender on pressure, and there is a tender swollen spot behind the angle of the jaw on the same side. Fetid discharge from right ear. Left pupil wider than right ; movements of head painful and neck stiff. Spleen can be felt. Minute subcutaneous hemorrhages in different parts of the body. Lumbar puncture showed leucocytes and a few diplococci. Operation exposed dura, which was not opened. Incision made into the anterior wall of the sinus, which looked greenish. The thrombus was partially dislodged and free bleeding occurred. It became necessary to tie the jugular vein. This was followed by very bad breathing, apparently due to pulmonary embolism. The patient did well for two days, and then suddenly developed a broncho-pneumonia, from which, however, he slowly recovered. On August 21, 1899, he was allowed to go out with a granulating wound, and his ultimate fate is unknown.

The cases which I have so far mentioned have been those in which the probable diagnosis was made at the time of operation, or before that, by lumbar puncture, and in which there was no complication with cerebral abscess. I have purposely avoided the latter class of cases of localized meningitis, as well as those due to traumatism, since both are not of value in cases dependent upon uncomplicated otitis.

Circumscribed otitic meningitis may progress like a case of beginning diffuse meningitis, and its progress may be gradual, with signs of meningeal irritation whenever there is any extension, though in the meantime all symptoms may disappear. In some cases focal symptoms may make the case simulate one of cerebral abscess. In one of our cases the only symptoms were papillitis and sacral pain, and in another severe headache alone was present.

A positive diagnosis is evidently very often impossible, but it is to be remembered that a circumscribed meningitis may give the symptoms of a diffuse process, and we should, therefore, not be too ready to give a fatal prognosis when a patient is apparently suffering from diffuse meningitis. Oppenheim says on this point: " The difficulties of diagnosis should compel us to make a diagnosis of diffuse suppurative meningitis with great caution. Schwartze emphasizes the fact that severe disturbances of the sensorium, with tonic and clonic spasm of the muscles of the extremities or with hemiplegic signs, tend to confirm the diagnosis, but this is not always the case, and the diagnosis should therefore not be made hastily."

Although a number of instances in which lumbar puncture has been made for diagnostic purposes have been recorded, the exact status of this procedure is not yet settled, and it must be remembered that lumbar puncture is not entirely without danger. Leutert adds to cases already reported a fatal result very soon after the puncture was made; he does not, however, think that the danger is of practical importance. It seems to me, however, that lumbar puncture is of no use in patients who seem practically lost, and that it can only be considered as giving valuable information as to whether a fatal disease is present or not in a small number of cases. Its employment is, however, not free from danger, and there is no guarantee that, in an otherwise not hopeless case, the last chance is not removed by the puncture. Oppenheim warns us that if the case happens to be one of brain abscess, the fall of pressure caused by the puncture may cause a rupture of the abscess, and furthermore, a localized meningitis may by the operation be caused to extend. There is also no certainty that we can claim trustworthy information to be got by this method which will overbalance the certain dangers.

Another important point in this connection is to decide if possible from the result of the puncture whether a meningitis is diffuse or circumscribed. Some authors, among them Leutert, consider that a negative result means a circumscribed meningitis in the presence of other signs, but others, as Stadelmann, consider only positive results as having any value, and also that even positive results are not always trustworthy. Turbid fluid and increase in albumen do not necessarily mean a diffuse meningitis, though the presence of these conditions in the spinal fluid may be considered a contra-indication to operation. Stadelmann believes that if the puncture shows bacteria in the spinal fluid, the meningitis is general, though our three cases do not support this view, so that the presence of bacteria is not of much positive prognostic value.

Gradenigo (*Arch. f. Ohrhlk.*, Bd. 47, 155) reports three cases all of which recovered in the presence of all symptoms of diffuse meningitis, and in two of which lumbar puncture showed turbid fluid from which staphylococci were cultivated. In one case a mastoid operation was done. In regard to lumbar puncture, we may sum up as follows: when the cerebro-spinal fluid is clear and sterile, diffuse meningitis is very improbable, but a circumscribed inflammation may be present; moderate turbidity and some bacteria do not always mean a hopeless condition; marked purulent turbidity shows the presence of a diffuse process practically hopeless, and rendering operation useless.

Most of my experience has been with the subacute forms of purulent meningitis, and it is certain that in some pretty extensive cases recovery can occur. Macewen operated upon five cases belonging to this class and one recovered, and Gradenigo's cases, mentioned above, also belong in this category. The circumscribed form of meningitis following otitis is certainly not necessarily fatal (Macewen, Lucae, Jansen, Brieger, Röpke, Knapp). The same is true of localized traumatic meningitis. Encapsulated areas of meningitis in the meninges of the spinal cord, and localized areas associated with brain abscess, have been recovered from in a number of reported cases.

I have been unable to find any case of meningitis following otitis in which cure has resulted without operation upon the primary focus, but it seems that occasionally spontaneous cure has resulted. Cases of so-called meningeal irritation in connection with acute or chronic aural suppuration are not uncommon, though such symptoms are often only the precursors of a diffuse meningitis. When the ear trouble is relieved, many such cases will improve and they may be put down as cures from circumscribed meningitis. Some of these cases, however, may be cases of "meningitis serosa," which may subside, or may go on and become purulent in unfavorable cases. I agree with Brieger that too much weight should not be attached to such a distinction.

It is, however, certain that circumscribed meningitis can subside without operation, since autopsy often shows later the presence of "white fibrous thickenings of the pia mater and the arachnoid, sometimes with adhesions to the dura." We must also mention as a kind of spontaneous recovery, what occurs in those cases which are operated upon for ear disease, and in which a circumscribed purulent meningitis is often present, which after operation is undoubtedly cured by resorption of inflammatory products. Some cases have been cured by incision of the dura, where the process was localized.

An exact answer to the question as to what degree the operative intervention was responsible for the cure cannot as yet be given.

In my opinion, however, certain conclusions can be drawn justly. The occurrence of a circumscribed area of meningitis is always dangerous to the patient, since it not uncommonly may be the starting-point of a diffuse process, and furthermore we are unable to say beforehand in which cases such a thing is liable to occur. It is therefore necessary in all such cases to assist nature in every possible way, either by removing the primary focus in the otitic process, or if necessary by incising the dura in the proper region. The removal of the primary focus is always a matter of much importance, since it is the manufactory of infecting material, and thus tends to cause the process to become diffuse. This removal of the primary process has been successful in many reported cases (Gradenigo, Brieger, and Case 3 in this paper). Some writers (Macewen, Lucae) have reported good results from incising the dura in cases of this class.

We must remember that when we incise the dura only a small portion of the pus is evacuated even in a case of circumscribed meningitis, and that the rest of the pus is in the subarachnoid space and shut off from the subdural space, and this remaining pus is the most important element in causing spread of the infection. To get the best results, the arachnoid must also be incised. Such a procedure is usually not mentioned in reported cases, since usually the dura and arachnoid are adherent so that one incision enters both, the arachnoid tissue being analogous to the subcutaneous cellular tissue on the surface of the body. This incision of the dura is perhaps not theoretically but appears to be practically useful, as the results show. In Case 1, mentioned above, we gained the impression that such an incision of the dura would have increased the chances of recovery. There is some danger that, owing to an error in diagnosis, the incision might open uninvolved meningeal areas which might easily become infected. Such cases have undoubtedly occurred but are very unusual.

The following two cases will illustrate incision of the dura. Their histories are briefly as follows:

CASE 4.—E. M., æt. fifteen. Has had discharge from the right ear for several years. Almost total destruction of middle ear. Part of malleus remains. Fistula into recessus. Slight discharge. Patient has been in hospital six months; had headache only once, nine months ago. He had, while away from the hospital, a sudden attack of pain, which diminished when the discharge became free. Soon thereafter chill and vomiting, which were repeated. The right mastoid region not sensitive; the jugular region only slightly so. A radical operation on mastoid was done April 20th, and pus and cholesteatoma found in large quantities. The sinus was considerably exposed and its wall looked dirty brown in color. The sinus was opened and dark blood, but no thrombus was evacuated. Five days later owing to repeated chills the jugular vein was ligated and the wound was examined. The posterior wall of the sinus looked gangrenous, and the same was true of the neighboring dura; free incision did not show any leptomeningitis. The patient soon developed a severe pyopneumothorax, which required a resection of the ribs, and from which recovery was slow. Suppuration continued severe in the mastoid region, the brain hernia was enormous and the patient gradually lost ground, dying on May 17th.

Autopsy showed no sign of meningitis. In the bulb of the jugular vein there was a focus of suppuration not reached by operation. Numerous old and recent suppurating foci in the lungs.

Case 5.—G. D., æt. five. When first seen was somnolent; had large abscess over right mastoid, right facial paralysis, and foul discharge from ear. Temp. 38.7°, pulse 104. Further history and diagnosis impossible. Operation, done at once, disclosed a large suppurating cavity in the mastoid. The sinus and the bulb of the jugular vein were freely laid bare, and a free incision into the sinus evacuated much foul pus. The posterior wall of the sinus looked gangrenous and was also incised. Pus was thus evacuated from the subdural space, and apparently from the arachnoid. During the next two days there were chills and alternating stupor and delirium. The jugular vein was tied, but the child failed steadily and died in two days.

Autopsy showed purulent infiltration of the meninges of the cerebellum. At the point of incision there was prolapse, and the sinus petrosus and sinus cavernosus contained purulent thrombi.

I find that Macewen, Lucae, and Paulsen (*Arch. f. klin. Chirurg.*, Bd. 52) agree with me as to the propriety of incising the dura under such circumstances as are shown in these cases. Many have opposed the plan of operating upon cases in which a diagnosis of meningitis is made, but the attitude of Macewen, Lucae, and Gradenigo is clear from what has been quoted. Jansen (*Berlin. klin. Woch.*, No. 35, 1895); Joel (*Deutsch. med. Woch.*, No. 8, 1895); Nasse (*Berl. klin. Woch.*, No. 3, 1895), and von Bergmann (*Chirurg. Behand. von Hirnkrank.*) have written upon the advisability of operating in cases of meningitis, without any general agreement. Lichtheim wishes to exclude meningitis by lumbar puncture before operating upon any case of abscess or sinus thrombosis. In our clinic we consider cases inoperable if all the classical symptoms of meningitis are present, or if the cerebro-spinal fluid shows macroscopic turbidity. One or several of these symptoms we look upon as demanding operation upon the original focus as soon as possible. If the dura is found apparently unchanged we wait a while and observe symptoms, but if it looks gangrenous, or if intracranial symptoms develop, it is incised at once, and the wound treated by packing. Of course many cases of this character will be lost, but one of the cases which I have reported represents a success, and I consider the reporting of failures as of as much importance as successes. The diagnostic difficulties are in many cases greater than the technical. The chance, however, of confusing an otitic meningitis with a case of the epidemic variety is, of course, small, but the differentiation of otitic from tubercular meningitis is not so easy, though a decision can usually be arrived at when the patient has been under observation for a short time. Most of our patients have been brought in in very bad general condition, so that accurate conclusions and histories were often impossible. Our experience has been that practically always the histories were incomplete, especially in the case of children, in whom it must also be remembered that a simple otitis media may give rise to symptoms like those of meningitis.

The following cases will illustrate how easily mistakes may be made in deciding whether the aural suppuration is the cause of the meningitis or not. In two of these cases the symptoms seemed to indicate brain abscess, in three we operated under the impression that there was a simple purulent meningitis present. In all, the future course and the autopsy showed a tubercular meningitis.

TWO CASES OF TUBERCULAR MENINGITIS SIMULATING BRAIN ABSCESS.

CASE 6.—W. K., æt. five. Well until eight weeks ago, then free discharge from the right ear began, and ceased after ten days, but the child did not recover his general health. A few weeks after this, attacks of vomiting set in; the patient began to emaciate, complain of headache, and cry out suddenly.

The child was carried to the clinic, where it was seen that there was special weakness of the left leg and left arm. The right membrana tympani was thickened and red; no perforation. Pulse 60. Sensorium somewhat dulled; responds slowly to questions. No stiffness of the neck. Vomits when he stands up. These symptoms were thought to point toward a localized cerebral affection originating in the aural trouble. In the eyes no noticeable swelling of the disks, margins ill-defined, veins distended and tortuous: optic neuritis. Lumbar puncture showed clear fluid.

Operation, December 27th.—Trephining over the squama was done and the dura exposed. It was tense and did not pulsate, and a fairly large canula plunged in various directions discovered nothing. Incision was made into it without result. Wound treated by packing. The patient failed steadily, and died January 8th, comatose, with a high temperature.

Autopsy showed tubercular meningitis; otherwise nothing significant.

CASE 7.—E. K., æt. one and a half. Brought to out-patient department in Jan., 1895, on account of discharge from left ear. Mastoid operation done March 7th, and followed by normal healing. Had cough and diffuse bronchitic râles.

On June 17th, while child was apparently well, he suddenly developed a temperature, was very restless, and then became apathetic. During the same afternoon there began to be convulsive movements of the right arm, the right leg, and right half of the face. The child made no sound and lay with the eyes rolled upwards. The fundus oculi showed the vessels somewhat dilated, but otherwise nothing special. Temp. 38°.

Next day child was admitted to the hospital. Old operation healed externally. Membrana tympani intact, percussion of left side of cranium apparently painful. Urine shows traces of albumen. Convulsive movements repeated from time to time. Stupor most of the time.

The operation of trephining was done, and punctures made without result into the temporal lobe. Death in a few days.

Autopsy. — Tubercular meningitis, tubercular broncho-pneumonia.

THREE CASES OF TUBERCULAR MENINGITIS, ONE SIMULATING OTITIC MENINGITIS.

CASE 8.—K. F., æt. two and a half, admitted to surgical clinic February 26, 1900. History of measles a year ago, followed after several months by discharge from left ear. One month ago, began to have evening temperature, and sometimes vomiting, which became worse.

Child is well nourished, has no stiffness in the neck; reflexes increased; is apathetic, does not respond when spoken to. Lungs normal, except somewhat heightened breathing sound.

Left auditory canal full of foul pus. Large perforation of membrana. Mastoid region negative. Symptoms indicated apparently a beginning meningitis, with the mastoid as the probable origin.

Operation on Mastoid, February 26th.—Mucous membrane of mastoid cells thickened, some pus in antrum. Dura of middle fossa showed no pulsation. Puncture negative. Tamponade. Patient did badly from the first, and died comatose March 2d.

Autopsy showed tubercular meningitis.

CASE 9.—K. B., æt. one. A younger brother had died apparently of tubercular meningitis. The boy himself had had for some time a (left side) discharge from the ear. September 5, 1899, he began to vomit and to have convulsive movements of the extremities. He is anæmic and very dull; occasional inco-ordinate movements of the eyes and nystagmus. Pupillary reflex retained. Hands clenched, abdomen retracted, and submaxillary lymphatics on both sides swollen. Operation done the same day showed some foul pus in the left mastoid cells, otherwise nothing important. The dura of the middle fossa was distended, and puncture brought a turbid serous fluid. This patient died in two days.

Autopsy showed tubercular meningitis, and broken-down tubercles in the corpus striatum, in corpora quadrigemina, in the occipital lobes, and in the cerebellum. Miliary deposits in both lungs.

CASE 10.—P. K., æt. two and a quarter. April 20, 1900. Parents and brothers and sisters all well. Child has had discharge from both ears for fifteen months. During past four days great mental dulness; mouth drawn to the left. Child is well nourished and has no signs of tuberculosis. Child has tendency to fall to the right. Right facial nerve apparently somewhat paretic. Large perforation in each drum membrane. No stiffness of neck. Probable diagnosis of meningitis starting from the aural disease. Lumbar puncture showed clear sterile fluid.

April 20th, operation on left mastoid. Dura unchanged. Antrum and tympanum full of pus. Mucous membrane thickened. April 24th, operation on right side showed about the same condition as was found on the left.

This child failed steadily, and died on June 30, 1900, and while no autopsy was permitted the case seems to have been one of tubercular meningitis.

Cases 6 and 7 presented much in common. In both children there were no direct signs of tuberculosis and in one the aural discharge ceased spontaneously and in the other stopped after operation. After an interval without symptoms covering several weeks, one child suddenly developed headache and began to vomit, and paralytic symptoms began on the side of the body opposite the diseased ear. This, however, did not last long. In the other child, convulsions occurred on the side opposite the disease, followed by paralysis with some rigidity. In neither case were there definite signs of meningitis. The lumbar puncture done in one case was without result. Operation did no good, and the picture of tubercular meningitis was gradually developed in both cases. The fact that the discharge from the ears was not important at the time of operation did not shut out the diagnosis of brain abscess, and there was nothing in either case pointing definitely towards tuberculosis. Paralyses in different parts are common enough in cases of brain abscess, but are unusual as early signs in meningitis. If it is seen in connection with discharge from the ear, especially when on the opposite side, the diagnosis of abscess is reasonable. In the first of this last series of cases described, one symptom may be described as in favor of meningitis, and that is temporary transitory improvement in the paralysis. In this case the paralysis of the left side of the body almost disappeared for an interval, and then returned.

In cases of abscesses, however, such changes in the condition of paralysis are possible, as for example in case an abscess cavity should communicate with the middle ear and by partial evacuation so relieve the pressure, perhaps on the internal capsule, that restoration of function would be possible. Such cases must be rare, and the rule is that paralysis caused by abscess does not improve, while in tubercular meningitis such occurrences are not uncommon.

Hirschberg (*Arch. f. klin. Med.*, Bd. 41) and Zappert (*Jahrbuch f. Kinderheilk.*, Bd. 40, p. 170) have discussed the occurrence of focal manifestations as the initial symptom in tubercular meningitis. Hirschberg mentions twenty-nine collected cases and three observed personally, in sixteen of which all signs of tuberculosis were absent, while in thirteen there were pulmonary indications pointing towards a possible meningeal complication. Five patients were children, the rest adults, among whom unilateral paralysis developed gradually in four and suddenly in eleven. Nine patients had localized motor disturbances and in three there was aphasia. Two of the children were hemiplegic, two had unilateral convulsions, and one had aphasia and convulsions. In seven cases there were rapid changes in the motor symptoms, notably improvement. Ten of the patients had more or less fever. The pulse did not show noteworthy changes and in only two cases was there a marked disproportion between the pulse and temperature. In most of the cases it was impossible to make an exact diagnosis, the difficulties of which Hirschberg emphasizes. We cannot depend too much upon the slowed pulse as an aid to diagnosis since it does not invariably accompany brain abscess.

Hirschberg comes to the conclusion from his cases that meningitis in children less often begins with motor disturbances than in adults, though Zappert's figures do not entirely confirm this.

In two of the latter's cases, stiffness of the neck was the first sign which pointed towards meningitis, and he also notices the fact that the paralytic symptoms in meningitis may improve and disappear after having reached a high degree of development.

We may conclude that among a not very large number of otherwise well persons, paralytic symptoms may be the first signs of a tubercular meningitis, and as a rule it is impossible to make a certain diagnosis under such circumstances. Not infrequently an unexpected improvement may occur in such symptoms, and this appears to me to be characteristic of meningitis.

I have already referred to the occurrence of focal symptoms in tubercular meningitis, and the fact has also been mentioned that localized meningitis of other varieties can sometimes cause the same kind of symptoms. Whether under the latter condition remissions may occur, I am unable to say. It would be interesting to know in how many of these cases of tubercular meningitis there was a history of discharge from the ears.

The combination of discharge from the ear with tubercular meningitis is not very rare, especially among children, as is emphasized by Körner (" Eitrige Erkrankungen "). In our cases this combination has occurred a number of times. Case 10 is of particular interest since the diagnosis was rendered still more doubtful than usual because the discharge was present in both ears. The lack of success after the first operation made us think that the meningitis was more extensive or that it was tubercular.

Although lack of success has attended many of these operations we need not therefore feel discouraged, for we may be certain that our operations have certainly in no way made the conditions of the patients any worse. I have to thank Professor Kümmel for the use of much clinical material.

PRIMARY OTITIS EXTERNA FROM A CLINICAL POINT OF VIEW.

By Dr. C. J. M. SCHMIDT, Odessa.

Translated by Dr. C. Mund, New York.

CLINICALLY, as a rule, external otitis is a primary and in most cases an inflammatory skin-disease, limited to the auditory canal. As the lining of the latter is a continuation of the integument in general, the similarity in the diseases of both is readily apparent, being identical physiologically. Therefore we have the same differentiation in diseases of the skin of the auditory canal as we have in those of the skin in general, viz.: diseases principally of the epithelium (ichthyosis, most pronounced form), and diseases with participation of the corium (dermatitis, mild form, and eczema, severe form). In cases of anomalous secretion distinct symptoms of dermatitis are frequently noticed. I regularly observed them in the monolateral lesions (cases of monolateral recurrence). In many cases of impacted cerumen the cerumen shows an admixture with the products of desquamation of the auditory canal. These circular lamellæ always envelop the dry ceruminous plugs and also are contained within them. After the removal of the plug for some time lamellæ peel from the skin of the auditory canal. In the normal ear we never find a large accumulation of cerumen. Too careful people meddle unnecessarily with the auditory canal in trying to clean it, whereby they are very likely to bring about an external otitis, which results in an anomaly of secretion. Cases in which the epidermis of the auditory canal alone is diseased are rare. They are characterized by the absence of pruritus and lead to the formation of epidermis-plugs. Wreden of Petersburg sometime described this as keratosis obturans. In a case of ichthyosis affecting the entire body, I observed a semi-annual recurrence of formation of epidermis-plugs. The patient was a young man sixteen years of age, from whose ears I removed two plugs. The skin of the auditory canal was in the same condition as the integument of the rest of the body. Perspiration was absent. In some cases of epithelium-disease the products of desquamation consist of small lamellæ, which look like white powder and are situated on the hair of the entrance into the canal. Although these powder-like lamellæ may be removed by means of cotton, desquamation nevertheless soon recurs. A colleague had both ears affected with this form of external otitis. I had him under observation quite a time, as the left ear showed a chronic suppuration of the attic, with a large perforation in Schrapnell's membrane and polypoid granulations on the edge of this perforation. Long-continued local treatment resulted in the formation of a cicatrix with cessation of the suppuration, so that the patient has been well since 1889. In 1897 a large epithelial plug was formed. The patient had not been examined for over half a year, having been free from all symptoms, and this accounts for the large size of the accumulation, which one night finally caused him severe pain. The plug, which was of an enormous size, was then removed. Small epithelial plugs had been removed from his ears before. It is understood that the mistake of diagnosing a cholesteatoma communicating with the auditory canal for an epithelial plug must be avoided. The two differ even in their appearance. Iridescent cholesteatomata occurring in the auditory canal in cases with a healthy and normal middle-ear, have, as far as I know, only been described by Politzer, on page 153 of his text-book; in two of these cases, however, the auditory canal did communicate with the antrum. The diseases mentioned constitute to a certain extent the beginning of the severer forms of dermatitis. The subjective symptoms are wanting, viz.: no itching. Pruritus is the most important and the most distressing symptom of the severe forms of dermatitis. Among these we have one form in which the skin is dry and remains so for a long time with absence of cerumen and with a great deal of itching. This would correspond to a cutaneous pruritus in which perspiration is often absent. In these cases the severity of itching in the auditory canal acts in the same manner as it does on the integument of the body—that is, it varies at different periods. Pruritus is so often associated with dermatitis that it is very difficult to differentiate which of the two is the primary. In true dermatitis the dry itching skin, as a rule, only represents the one stage (of the disease), which more or less readily changes into the other, the moist one, in which a copious discharge of a clear watery fluid takes place, especially following severe irritation (scratching)—a fact of which many patients inform us. Following this for a greater or lesser period, the dry stage of dermatitis is transformed into the moist form. The disease is a most severe and insidious one; when in connection with eczema and also when occurring in the auditory canal, it is dreaded for its protracted course, which to a great extent is due to the fact that the mechanical insults and the minute infections caused by the severe and lasting itching are unavoidable. In the moist stage of dermatitis the auditory canal contains a greasy, whitish, doughy, bad-smelling substance in place of cerumen. The underlying skin is reddened and in some parts excoriated, but with very little general swelling (except after irritation and in eczema). The troublesome itching induces the patient to scratch, in consequence of which infection results. In the dispensary these cases are in a general way treated as diffuse and circumscribed inflammations of the auditory canal. The skin (of the auditory canal), easily damaged and altered by dermatitis, appears to induce aural conditions favorable for infection. Thus it is an apparent fact, that in general a healthy auditory canal rarely is primarily diseased from these infections. Scratching—infection—produces furuncle and, according to my experience, very frequently suppurative phlegmonous cellulitis in the auditory canal; furthermore pseudo-erysipelas, which spreads all over the entire ear and over the corresponding half of the head, or true erysipelas; finally chronic and acute infiltrations about the ear, also periostitic abscess of the mastoid process. Evidently the cause of all these lesions without any exception is contact-infection by means of infected instruments, which are used for scratching, such as ear-spoons, hair-pins, coiled towel and handkerchief corners, small pieces of paper, matches, the points of spectacle-frame hooks, cotton swabs, etc. In every instance the patient has admitted having used these instruments for scratching; on the other hand I have very frequently observed that the patient never again suffered from infection after having given up the habit of scratching. The dermatitis in these cases nevertheless continues with varying degrees of intensity. Notwithstanding the intensity of the itching the occurrence of such an infection is remarkably rare. Furthermore the term "otitis ex infectione" includes acute inflammation of the auditory canal with swelling of the surrounding tissues. Patches, bloody from scratching, or localized swellings may be the only manifestations. Pain and anxiety induce the patient to see the physician. If from now on scratching be stopped, then the parts attain rest and, provided infection has as yet not taken place, return to the normal state. In case of infection, however, as a rule a general swelling of the auditory canal ensues quite rapidly. The swelling arrives at its height within twelve hours and is accompanied by severe increasing pain. It is rare for it to come on slowly with but moderate pain and to take from 8–14 days for its development. In that case the infection is less severe, and the skin is more resisting. The result of this is a very irregular and more dense infiltration of the auditory canal. Abscesses are rare in these cases. Both forms finally show the same condition, viz.: auditory canal swollen and containing scales and a greasy substance; drum-membrane more or less intact and reddened. Such swellings—even when of large extent—of acute or chronic origin may go down without formation of abscess or furuncle, especially if proper antiseptic treatment is used. Few of them, however, cannot be checked, and go on to abscess formation. Then an incision has to be made or spontaneous rupture takes place. It is only at this stage that it is clinically possible to determine whether the case is one of large furuncle or one of ordinary abscess. If it be a furuncle, a core is discharged; or in case of abscess the characteristic round defect in tissue with its necrotic edge is apparent. Small furuncles originate from circumscribed infection, and run their course with but moderate swelling of the walls of the auditory canal. The patient usually suffers great pain until the abscess bursts. The infection may, however, behave like a cold abscess and without pain.

CASE: Patient came to me for treatment March 8, 1897. Swelling of auditory canal of nine days' duration. Sensation of fulness in left ear. Lumen of auditory canal narrowed down to a slit. No pain. Two days later spontaneous rupture of swelling. The patient had been in the habit of constantly using an ear-spoon.

The remaining severe local affections of the auditory canal, *viz.*: abscess formation, gangrene, caries of the bony walls, as far as they can be considered as having any connection at all with simple dermatitis, or sequelæ of the latter, are brought about by constant maltreatment and by reinfection from the milder forms. They are the misfortune of the poorer class of people, while they do not occur among the better class. Whenever the infection of the auditory canal leads to progressive inflammation, the lesion shows itself rather as pseudo-erysipelas than as progressive phlegmon, which term has without sufficient reason been used for a special form of disease, "otitis ex infectione."

To this category belongs a case, which for a long time had semi-annual recurrences, and which was described by me in 1893, in notes on the translation into the Russian language of Hartmann's text-book on *Diseases of the Ear.* Patient formerly had suffered two or three times a year from such an acute swelling of the face with a simultaneous swelling of the auditory canal and entire region about the ear. When I saw him first (1891) the right side of his face was affected; lumen of auditory canal narrowed down to a slit; concha irregularly swollen, reddened; half of the face puffed up and swollen; relatively little pain; evening temperature above 38° C.; swelling gradually went down within eight days. During this time the following anamnesis was obtained, viz.: owing to the fact that he had been ailing for a long time, and was in the habit of travelling a great deal, the patient had in his possession a complete instrument case, which contained a variety of drugs and ear instruments, especially all sorts of spoons and small sponges. For a year, probably since childhood, he had chronic external otitis, with a great deal of itching and abnormal secretion. Regularly every 4–6 months he would, by scratching and cleansing, produce the inflammation mentioned above as pseudo-erysipelas. This was his last attack, for once convinced of the real cause of his affection he very carefully avoided all scratching within the auditory canal. The dermatitis, however, continues with quite severe exacerbations from time to time ; for example, during the summer of 1897, when the disease presented the insidiousness and infiltration of an eczema.

I have observed severe erysipelas originating in a similar way within the auditory canal. Another variety are the cases, where an infiltration of the soft parts over the mastoid process takes place in the form of an acute or chronic periostitis, of course with intact middle ear. Pus may form, or the infiltration may go down after long duration.

Case 1.—Painful infiltration over mastoid process extending diffusely over region of neck, of two months' duration. Chronic external otitis. Formerly a great deal of itching ; patient frequently scratched his auditory canal with matches and fingers. Auditory canal now intensely swollen ; middle ear normal ; membrana tympani but slightly reddened ; no otorrhœa. After application of alcohol-compresses within auditory canal and over region of ear the infiltration, which at first was very tender on pressure, subsided within 10 days. Gradual and complete recovery resulted, the swelling of the auditory canal gradually going down under the alcohol treatment.

Case 2.—Girl, fourteen years of age ; painful infiltration, indistinctly fluctuating at time of admission, developed over left mastoid process, within two months, from chronic external otitis. Middle ear normal ; membrana tympani intact ; auditory canal moderately swollen. Formerly patient frequently had used hairpins to allay itching. In right ear no dermatitis, no itching, no trouble of any kind. Incision and scraping of periostitic abscess. Iodoform dressings. Recovery.

The most important difficulty in diagnosing these acute swellings of the auditory canal lies in the exclusion of otitis externa consecutiva (secondary to acute or chronic otitis media), the presence of which indicates retention of pus within the cavities of the middle ear. I have only once seen an abrupt swelling of the auditory canal and of its surroundings in a case of acute otitis media, where the swelling was not due to this cause. I describe the case here, it being a very rare one.

During the third week of an acute otitis media, unexpectedly and abruptly an acute swelling of the auditory canal, and a doughy swelling of the region about the ear, including auricle, appeared; pain but slight in general, moderate rise in temperature. The cellular inflammation soon subsides. For several days the co-existing otitis media made me suspicious of retention of pus. With the rapid subsidence of the swelling, however, this apprehension soon vanished. Subsequently the fact was confirmed, that the patient had been scratching his ear canal with matches for the purpose of allaying itching. This probably accounts for the fact that the infection had originated inside the auditory canal.

In regard to the treatment of these forms of external otitis, three remedies always are sufficient in my hands. These are a medicated oil, a medicated alcohol, and a sublimate solution (1:1000) used for preparing an antiseptic occlusive dressing. Of oils I prefer the oil of thyme, in the concentration of from 1:100–1:1000. This is used in squamous, unirritating dermatitis and is to be instilled directly from the bottle. Cotton must not be retained in the ear-canal. If the oil is to be applied by means of a cotton swab, the patient at the same time must be instructed to disinfect hands and finger nails with alcohol, previous to treatment. The oil, as a rule, will not cake. The skin loses its dryness and attains a smooth, soft surface. The symptoms (itching and slight pain) gradually subside. Oil of thyme also suffices for the squamous stage of eczema and as a rule is preferable to ointments. Bezold condemns the treatment with oil altogether, attributing to it the causation of aspergillus-mycosis. I believe, however, that this needs to be feared only among the poor. Really I never saw it occur in practice among the better class. Aspergillus-mycosis has but very seldom been met with during a course of oil treatment. The relatively large amount of thyme in it possibly guarded against such a complication. Moreover, it is quite easy to cure an acute case of mycosis by means of alcohol. The advantages gained by the treatment in oil in suitable cases are so pronounced that this method cannot very well be abandoned. Watery solutions of drugs, also pure water, are not well tolerated in dermatitis of the auditory canal, no more than they are in dermatitis of the integument; therefore they are to be avoided. As a remedy for the moist stage of dermatitis alcohol ranks first. It desiccates, allays itching, and disinfects. Its use is general. I use a 10% alcoholic solution of cocaine. Alcohol furthermore has the great advantage, that it can be entrusted to the patient for self-treatment. In combination, under circumstances with the oil treatment (in the squamous stage), it has cured many of my patients, who were residing at too great a distance from me for the necessarily frequent office treatment. When infection from scratching has resulted or is to be anticipated, when perhaps an acute swelling of the auditory canal has made its appearance, then — owing to the happy results obtained by me for the past six years — I recommend to try and disinfect the auditory canal by means of packing it with cotton saturated with bichloride solution. The bichloride solution (1:1000) such as is used for disinfection in general surgery is usually well tolerated by the skin of the auditory canal, even in eczematous cases. In treating the disease of the auditory canal in question, the efficient antiseptic property of the sublimate solution here also is demonstrated by the fact that under its use the inflammations mentioned above subside more rapidly (often without suppuration, which is very likely prevented by it) and that recurrence by reinfection, in case of furuncle for example, is averted. Should formation of pus take place under the antiseptic dressing, we have the advantage at any moment of being able to make an incision in a perfectly aseptic region. With the aid of reflected light and a narrow speculum (one not tapering conically), a slender tampon of cotton, saturated with the sublimate solution, is inserted through the narrowed lumen of the meatus into the auditory canal, if possible as far as the drum-membrane. This procedure is often a tedious one, but nevertheless it is the most important part of the treatment. The fatty products of secretion and desquamation having been removed from the auditory canal (by means of a slender probe and syringing through a speculum), we proceed as follows: The tampon having successfully and properly been introduced into the auditory canal, another one, also saturated with the bichloride solution, is placed into the concha, and over this dry cotton is applied. The patient then is instructed to apply (by instillation) a small quantity of the bichloride solution (1:1000) to the tampon of the ear-canal every four hours. For this purpose the outer layer of cotton must be removed. The tampon must not under any circumstances be removed by the patient himself, not even on account of increased pain. I have learned by experience, that as long as the tampon is retained in its place the patient's condition remains a tolerable one, and that impatience only can induce the patient to remove this important means of disinfection, which would protract the course of the disease. The tampon has to be removed from the auditory canal every twenty-four hours by the physician himself. If it be allowed to be retained longer than twenty-four hours, the secretion, which it has absorbed, will cause it to attain a foul odor, even in spite of the bichloride solution. Then pain will arise anew, as I have frequently observed. The latter, however, soon subsided after removal of the tampon. For the relief of pain the patient may take morphine internally and may be allowed to make dry hot applications over the antiseptic dressing. Frequently the swelling goes down after a short time, and pain decreases. Should formation of abscess or furuncle take place, then — as stated above — we have the opportunity to make an incision in an aseptic region. After the incision has been made we must continue with the antiseptic occlusive dressing, by means of which reinfection, even in case of furuncle, as a rule is certain to be averted. When incision was refused, then the spontaneous course appeared to me to have been less painful to the patient — under the antiseptic occlusion — than formerly without it. The various mechanical irritations on the part of the impatient sufferer are thus also entirely avoided. Spontaneous evacuation of pus through the skin is noticeable under the dressing by a sudden amelioration of the symptoms. In renewing the dressing the pus will be detected on the tampon. Experience teaches how long the sublimate tampon is to be continued. In general it would be injurious to discontinue it too soon. To me, from three to four days seemed to be sufficient. Only in two instances I had reason to believe that the antiseptic treatment had been kept up too long, inasmuch as after discontinuing the same the skin desquamated for a time. This, however, was of no further consequence. In one instance I observed that the prophylactic, the too frequent (hourly for twenty-four hours) application of the bichloride solution, had produced vesicles. The complication disappeared without medication, simply by discontinuing the energetic treatment. Under the sublimate treatment the skin of the auditory canal soon attains a whitish tumefied appearance. Frequently dark discolorations are seen on the surface of the tampon after its removal. In a short time the good effect of successful antisepsis is noticeable. As the swelling goes down, the instillations are to be practised less frequently by the patient. Finally the tampon is allowed to dry and is simply renewed every twenty-four hours until finally it may be done away with altogether. Then for several days the auditory canal is not to be touched in any way. The skin will return to the normal state of itself. I have rarely employed the sublimate treatment in children. Though their skin is more tender and tumefies more readily, I have never noticed any injurious effects from this method of treatment. If any fear of resorption be entertained, the instillations can be used less frequently or in weaker solutions. As a matter of fact I have observed acute swelling of the auditory canal "ex infectione" to occur less frequently in children than in adults. In comparison with sublimate, other remedies recommended in a similar way have appeared to me to be less effectual. I tried solution of acetate of alum and carbolic glycerin (10°–20°). Of the various drugs in powder, which are used in the moist stage of external otitis, Bezold praises boric acid very highly. Although this has the property of reducing to a minimum the moisture present in the auditory canal, it on the other hand has the tendency to become lodged in the ear-canal either in the form of dry grains or as cohering flat crusts. As these prevent healing, boric-acid powder is unfit to be given to patients for self-treatment. Of late (1899) I have seen two cases of dermatitis in the exacerbation of the moist stage in which only boric-acid powder would do any good, whilst alcohol caused irritation with increased secretion. In regard to the general treatment, we always have to consider that dermatitis of the auditory canal is eminently a chronic disease. I have followed cases with all their mild and severe recurrences for eleven years. These include true eczema as well as simple and mild forms of dermatitis. Both may therefore appear as being incurable. It is only too natural that in treating so persistent a disease as eczema one should try a number of other remedies. Although they occasionally prove successful, I for my part never could see any special indication for any of them, inasmuch as my treatment, mentioned above, answered the purpose to my entire satisfaction, viz.: oil was preferable to ointments, and the most important point was to prevent mechanical insults and infection. Many patients do best without any treatment.

Otitis externa mycotica is easily diagnosed and as a rule subsides readily under treatment with alcohol. Thimble-shaped skin casts and black or reddish-yellow spots are characteristic of mycosis. When their presence is detected, the diagnosis is verified by the naked eye and the microscope. I have seen mycosis only in connection with dermatitis of the auditory canal.

Otitis externa hæmorrhagica, which generally is a traumatic dermatitis, is often associated with myringitis of the same kind and occasionally is caused by bathing. It is of rare occurrence and shows nothing of special interest, the same, as for example, primary herpes (of the auditory canal) of which I have seen one case.

Otitis externa crouposa primaria is also a very rare disease. The following five cases were observed during ten years.

CASE 1.—Girl, three years old. Measles which ran a normal course. Three days later reappearance of fever, which at first was attributed to constipation, until finally pain in the ear set in. February 15, 1888, consultation. Both auditory canals filled with croupous membranes ; these were easily and completely removed by syringing ; lumen of canals almost closed by irregular swelling of the walls, which are not denuded of epithelium, but bleed even on the most careful touch with the probe ; swelling most marked on posterior part of upper wall. The following two days the temperature reduced (38.3°–38.4° ; 37.7°–38.4°) ; pseudo-membranes removed daily by syringing ; no more fever. Six days later, no more membrane ; swelling gradually subsides, and recovery progresses favorably ; inflation of right ear once gave the whistling sound characteristic of perforation, although the secretion almost always was absent. Fourteen days after beginning of disease the swelling of right side entirely gone ; drum-membrane now visible and intact. Eight days later, swelling of left ear, which was more severely affected than the right, also had disappeared ; here, in the left ear, we find attached to the posterior part of the upper wall and to the left, close to the membrana tympani, a pediculated polypus ; this was removed by means of the cold snare. The operation had to be performed under chloroform narcosis, owing to the extreme nervousness and struggling of the patient. Complete recovery.

CASE 2.—Woman, thirty-eight years of age. Otitis externa crouposa acuta (both), on October 25, 1889, resulted in almost complete deafness. Disease in the two ears differs. On left side membrane removed daily for six days, later less frequently ; on right side membrane remained lodged for twenty-two days. Constant severe pain often deprived patient of sleep ; great deal of buzzing in ears ; hearing-power poor. On the twenty-third day both ears give whistling sound, characteristic of perforation ; suppuration. Not until a month after the beginning of the disease, canals free from membrane ; otorrhœa and pain continue till about the fortieth day, then otorrhœa ceases. Left side: drum-membrane intact, and only intensely reddened; middle ear free. On right side, dry perforation sound. Lumen of both canals now seen to be narrowed by hyperostosis. Under these unfavorable conditions otitis externa crouposa had developed and run an especially protracted and severe course. The inflammation had caused a secondary perforation of the membr. tymp., and an affection of the middle ear in the form of an ordinary inflammation, and finally resulted in recovery, after which the lumen of the auditory canals were but half the normal size; hammer and parts of the membr. tymp. faintly visible. Hearing-power: whisper R, 4 *m*; L, 6 *m*. This, the patient stated, had been her normal hearing-power before. The anamnesis of the case revealed the fact that the patient never had cerumen, but that she almost always had been suffering from itching in the auditory canal—that is, from chronic dermatitis.

CASE 3.—Man, thirty years old, presents himself January 20, 1890, after having, for six days, suffered most excruciating pain in the right ear. Otitis externa crouposa dextr. Syringing dislodges the membrane in toto. The following day a thin membrane was removed, after which a furuncle developed. Finally complete recovery.

CASE 4.—December 31, 1890. Patient, a woman twenty-five years of age; for two weeks pain and buzzing in right ear. She attributes the cause to a strong draught of wind. Right ear: large fibrinous exudation; the false membrane, after its removal, shows a distinct imprint of the membrana tympani; two days later (January 2, 1891), another membrane removed in toto. Left ear: acute catarrhal otitis media, which soon subsides without any perforation of the membr. tymp. No further formation of membrane in right ear. The intense reddening of the ear-canal and of the membr. tymp. gradually disappears. Recovery.

CASE 5.—September 30, 1895. A woman, thirty-three years old, taken sick three days ago. Severe pain in left ear; the parts about the ear very sensitive, but not swollen; auditory canal filled with a white mass. By means of syringing, a large cohering exudation, filling the entire canal, is removed. The walls of the canal strongly injected and moderately swollen. Hearing-power greatly reduced; conversation voice heard at a distance of 1 *m*; thus an otitis media was also suspected; sublimate compress

(1:1000); ear canal tamponed. The following day paracentesis of membr. tymp., but no secretion; severe constant pain. The next day removal of another croupous exudation; no râles of any kind on catheterization; perforation of membr. tymp. closed; insufflation of powdered iodoform. On the fourth, fifth, sixth, and eighth day, each time a freshly formed croupous exudation removed by means of syringing; sublimate dressing again applied on account of constant severe pain. After this gradual subsidence of pain and steady decrease in amount of exudation, which at last, on the fifteenth day, ceased. Hearing-power remained poor; conversation voice heard at the distance of 1½ *m*. Very likely the patient formerly had reduced hearing-power. Recovery.

This case, also No. 2, above all, corroborate the occurrence in otitis externa crouposa of that characteristic pain, which has been described by Bezold as "most excruciating." My cases are analogous to those of Bezold in every other respect. Only the abnormal narrowing of the lumen of the auditory canal in case No. 2, due to hyperostosis, caused an unusually insidious course of the disease. In regard to the treatment, powdered iodoform, sublimate dressing, respectively at times, appear to me to be the best remedies. Histological and bacteriological examinations of my cases were not made.

TOPOGRAPHIC ANATOMY AND OPERATIVE TECHNIQUE OF OTITIC ABSCESS OF THE TEMPORAL LOBE.

BY DR. H. PREYSING, LEIPZIG.

Translated and Abridged by DR. O. JOACHIM, New Orleans.

(With three illustrations on Plates V.-VII. of Vol. XXVII. of Germ. Ed.)

THREE additional cases of abscess of the temporal lobe, which I was able to examine at autopsy since the date of my first publication (*Zeitschrift f. Ohrenhlk.*, vol. xxxv., p. 108; these ARCHIVES, vol. xxx., p. 25), lead me to confirm the correctness of the course of operation previously advocated: "Do a radical operation first, then proceed through the tegmen directly upward."

CASE I. (Plate V., Outline ii.)—An abscess of the right temporal lobe was opened after radical operation; leptomeningitis and death followed.

Autopsy of the Cranium.—A large funnel-shaped wound behind the right ear, embracing the entire mastoid process and the lower part of the squama, leads to the tympanum, and the floor of the middle and posterior cranial cavities. The sigmoidal sinus down to the jugular bulb, the tegmen of the antrum and tympanum, and a small part of the brain under the squamous portion are exposed. The sigmoid sinus is not thrombosed and is covered with recent granulations; a perforation of the dura of the middle cerebral fossa exists externally to the tegmen tympani and communicates with a cavity in the right temporal lobe of the size of a pigeon's egg, which still contains pus and dirty granular masses, and is lined with tough walls. The cerebral convolutions are flattened and the pia of the convex surface of the right hemisphere is hyperæmic ; at the base it is infiltrated with pus ; the dura shows on its inner surface ecchymotic spots. The substance of the brain about the abscess is cloudy, soft, and discolored.

CASE 2 (Plate V., Outline iii.).—An abscess of the right temporal lobe was incised after a radical operation. The tenaceous contents did not escape, but ruptured into the lower horn of the lateral ventricle and caused death by purulent leptomeningitis.

Autopsy of the Cranium.—The wound in the right temporal bone embraces the region of the mastoid, tympanum, and antrum, and extends into the middle and posterior cranial fossæ. The dura appears normal, except for an area as large as a pinhead between the roof of the antrum and the edge of the pyramid, just back of the right superior semicircular canal, where it is discolored a dirty reddish-brown. A horizontal section of the brain discloses a large abscess in the right temporal lobe, with dirty granular contents. The walls are firm and are surrounded by softened and discolored cerebral substance. The right lateral ventricle is distended with thick green pus, displacing the ventricular septum. A large opening establishes communication between the abscess and the inferior horn of the ventricle. The brain substance between the abscess cavity and the squama is fully 1 *cm* thick, but between the cavity and the tegmen it measures only ½ *mm*. On the lower-outer portion of the abscess a hemorrhagic area indicates the line of incision made at operation. The pia of the convexity is extremely congested. A large circumscribed pus focus is situated between the upper surface of the cerebellum and the tentorium and extends along the sigmoid sinus and the auditory nerve. The sinus is not thrombosed and is of normal appearance, excepting a sanguineous discoloration on the surface exposed by the operation.

TECHNIQUE OF THE AUTOPSY.

The aural surgeon at the post-mortem examination of a brain must determine the presence, the origin, and extent of a leptomeningitis or of an abscess. The first part of the question may be solved by any one of the usual autopsy methods. On the other hand, the usual method, *i. e.*, Virchow's, where, after separating the cerebral hemispheres, the lateral ventricles are opened and the hemispheres divided in sagittal sections like the leaves of a book, is really most unsuitable for our purposes. An insight into the topography of a brain abscess, its relation to important parts of the brain and to certain parts of the temporal bone, is only furnished by a few large sections.

Three sections of the brain are necessary:

1st. A horizontal section through both hemispheres, which permits the recognition of displacements by inflammatory œdema of the diseased hemisphere, its influence on the internal capsule, and variations in the kind and quantity of the contents of the lateral ventricle.

2d. A sagittal section through the diseased hemisphere to demonstrate the relation of the abscess to the Sylvian fissure, its extent in the temporal lobe, especially in disease of the left side, associated with disturbances of speech, and the point of communication with the tegmen of the tympanum or antrum.

3d. A frontal section to show the relation to the lateral ventricle and mastoid antrum.

In making the horizontal section (see these ARCHIVES, vol. xxx., p. 26), the calvarium may be removed as the dura holds the upper part of the cerebrum sufficiently together. The sagittal and frontal sections necessitate the removal of the brain *in toto* and a previous fixation and hardening. During the hardening process the lateral parts of the brain should be well supported or the entire brain should be suspended in a cloth. The sagittal section should be made between the external and middle third of the affected hemisphere, and the frontal section on a line just posterior to the base of the pons.

The horizontal section in the three cases showed that the thickness of the brain substance contiguous to the squamous portion was in no case less than 1 *cm* at the thinnest point, and not more than ½ *mm* over the tegmen. The displacement of the median line and the distension of the lateral ventricle varied according to the size of the abscess and the amount of œdema.

The outlines of the three additional abscesses are shown in the sagittal section, on Plate V., Figure 1, as they occurred on the same and the right side. The thinnest part of the abscess wall was in every case directly over the tympanum and mastoid antrum. The resistance of the cortex to the disorganizing process, excepting at the point of communication, was noted in all cases.

The frontal section (Plate VI.) is made through the mastoid antrum and represents a combination of Case 2 (perforation through the tegmen antri), and Case 3 (perforation into the lower horn of the lateral ventricle).

TECHNIQUE OF THE OPERATION.

The proximity of the otitic brain abscess to the primary purulent focus has established the adoption of the method of opening the mastoid previous to the exploration of the temporal lobe. Bone disease productive of brain abscess extends almost invariably to the tegmen of the antrum or tympanum, a region which is fully exposed in every operation. Precise rules for making an exploratory puncture do not exist. Hansberg[1] recommended, in the absence of a fistulous opening through the dura into the brain, the trephining over the squamous portion of the temporal bone, and one or more punctures with a hollow needle inwardly not deeper than 3 *cm* to avoid injury to the lateral ventricle. Macewen's method of exploration from the same point, in the direction forward, inward, and downward, finds perhaps more followers among aural surgeons. As many operators have only succeeded in finding the abscess after repeated attempts, the question of a more certain method suggests itself. An incision in the region directly over the tegmen of the tympanum or antrum affords, on account of the proximity of the abscess, a much better prospect of finding even a small accumulation than a lateral incision. As it is impossible to make a perpendicularly upward incision with a straight scalpel, a lancet with a shaft bent at a right angle should be used. I have had such a knife made. The blade is lance-shaped, sharp on the sides and point, and about 3 *cm* long. The shaft, which it joins at a right angle, is fastened to a handle with a screw,

---

[1] *Arch. f. Ohrenhlk.*, vol. xxv., 1894, p. 19.

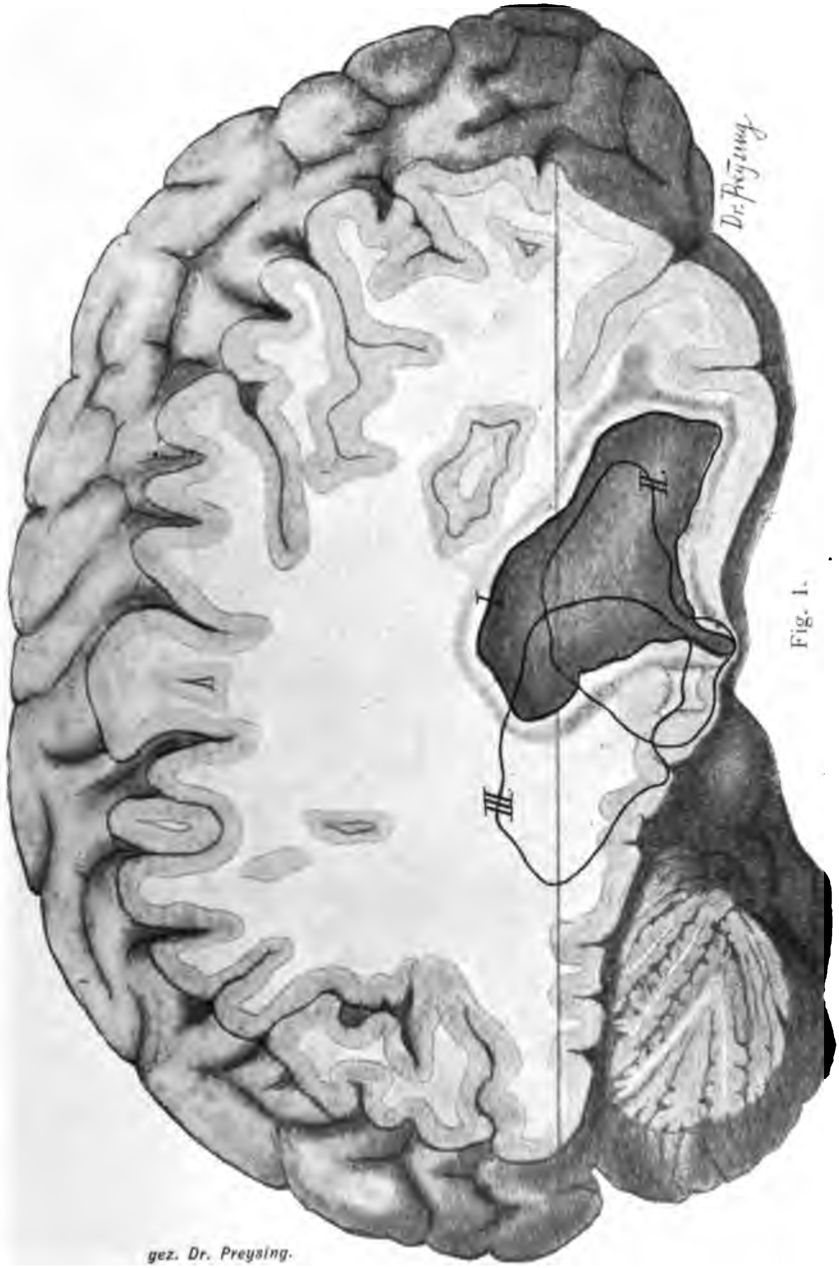
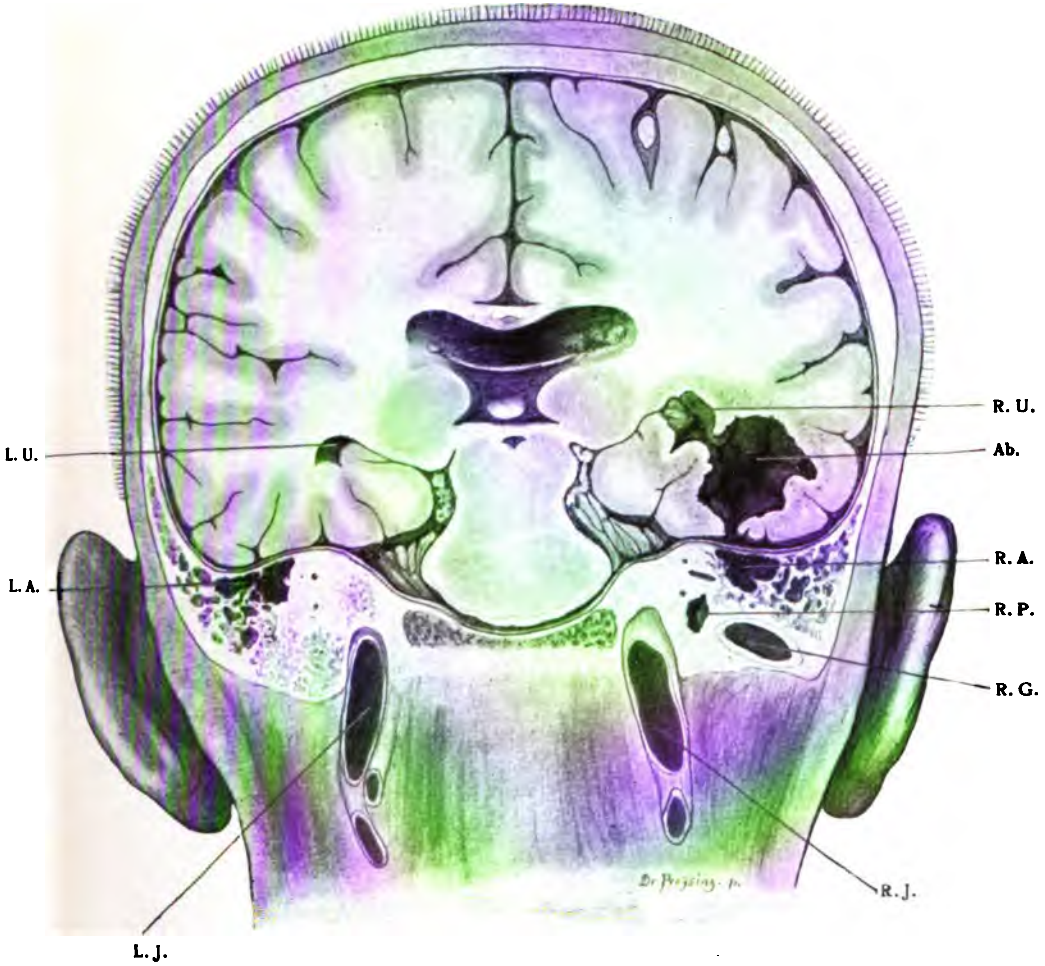


Fig. 1.

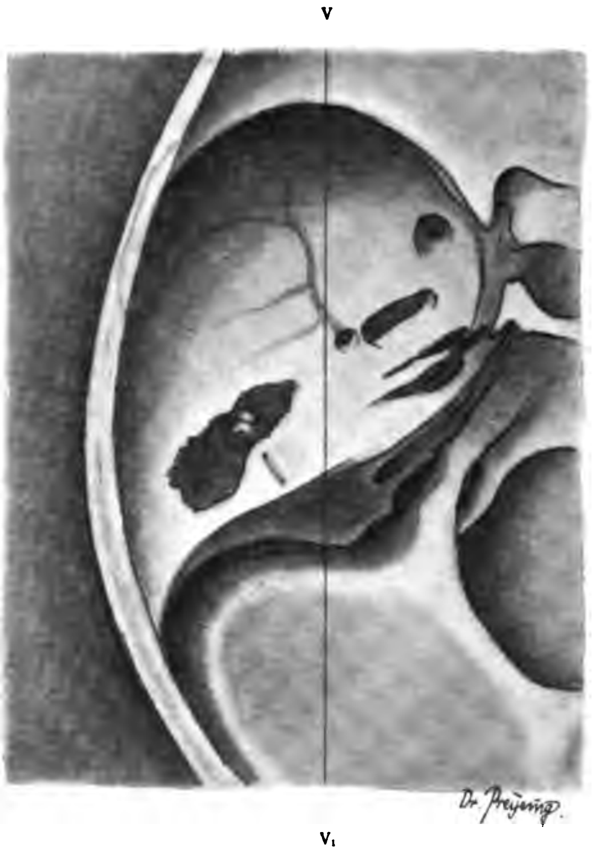
gez. Dr. Preysing.

VERLAG VON J. F. BERGMANN, WIESBAD

Tafel VI.



VERLAG VON J. F. BERGMANN, WIESBADEN.


V
V₁
Dr. Preysing p.

to permit the removal of the knife for sharpening. The screw also indicates the direction of the knife.

The dura should be laid bare as freely as possible over the antrum and tympanum and a crosswise incision be made, thus lessening the danger of an infection of the subarachnoidal space.

In introducing the knife the handle should at first be elevated with the blade resting against the median wall of the antrum, and while lowering the handle to a right angle with the sagittal plane of the head, the blade is gently inserted upward into the brain substance to its bend. If done in this manner, injury to the lateral ventricle is practically impossible. With the knife in this position, and the bend resting against the inner wall of the antrum, a rotary motion of 45° should be made until the knife strikes the tegmen tympani. Gentle traction causes the wound to gap.

The knife should be removed by exact reversal of the above procedure. Besides severing the vessels of the pia mater, avoiding injury to the lateral ventricle is of greatest importance. This danger is less in this than in any other method of puncture, as the knife acts in a plane external to the ventricle.

Plate VII. ($\frac{9}{10}$ natural size) reproduces the floor of the left middle fossa with communicating openings into the antrum, tympanum, and superior semicircular canal. The line $V\ V_1$ gives the most external point of the lower horn of the lateral ventricle. (Compare Plate VI.) It demonstrates that by correct introduction of the knife an injury to the lateral ventricle is very unlikely in the healthy brain, and the inward and upward displacement which an abscess always produces renders this contingency even less probable. Functionally important areas are also exempt from injury by this method.

This procedure is recommended for trial without making claim for any new definite method of operation. Should pus be found, further procedures are governed by the necessities of the individual case.

THE OTOLOGICAL SOCIETY OF THE UNITED KINGDOM, MEETING DECEMBER 3, 1900.

Sir W. B. DALBY, President, in the chair.

A case of deafness, perversion of taste, and facial paralysis associated with herpes. Shown by Mr. A. H. CHEATLE.

The patient, an unmarried woman aged twenty-seven, had never suffered from her ear until the present attack. No definite history of syphilis could be elicited, but she had pigmented scars upon both legs and a smooth ulcer the size of a threepenny piece on the calf of the left leg. A fortnight before being seen at hospital she noticed some "blisters" on the right of the middle line of her neck, below the chin and above the sternum. Several other such spots appeared in lines running to the back of the neck, as well as an isolated one immediately in front of the lobule of the ear. Shortly after the appearance of these spots severe neuralgic pains were experienced in the back of the neck and behind the ear, together with a roaring noise and deafness in the right ear. Right facial paralysis was also present. A week after the facial paralysis appeared she had an attack of vertigo lasting two days, accompanied by vomiting. Her sense of taste also became perverted. On examination there was right facial paralysis; the right membrane was slightly retracted. She was placed on iodide and counter-irritation was used behind the ear.

Mr. Cheatle desired to know whether any of the members present had met with a similar case, as he considered the symptoms associated with this particular case very uncommon.

Discussion.—Dr. MILLIGAN asked whether the patient had had any previous attack of Russian influenza. He considered the case to be one of peripheral neuritis, probably post-influenzal. Mr. BALLANCE agreed with this expression of opinion. Mr. CHEATLE replied that the patient had not had influenza lately, but she was exposed to cold a few weeks before the present symptoms came on.

Notes of a case of bilateral auditory nerve paralysis in a case of intracranial tumor. By Mr. C. H. Fagge.

The patient, a female aged nineteen, was admitted into Guy's Hospital, under the care of Dr. Hale White, in October, 1900, complaining of vomiting and dizziness. The patient's mother had suffered from ear disease. Several years ago the patient began to get deaf upon the left side and to suffer from noises in the ear and from giddiness. Shortly afterwards she became gradually deaf in the right ear; her eyes also began to trouble her, the left becoming blind, and shortly afterwards the right also. On admission, she was found to be blind in both eyes and deaf in both ears, and complained also of noises in the head and dizziness; no paralysis of motion, but a tendency to fall slightly to the left side when walking; no alteration of sensation; frontal and occipital headache; reflexes normal; mental faculties good; speech normal.

Discussion.—Mr. Cheatle asked about the characteristics of the vertigo—was it true auditory vertigo? He hoped that if the patient died Mr. Fagge would secure a section of the labyrinth of both sides and a full post-mortem report. Dr. Milligan asked whether puncture of the lumbar theca had been performed and the fluid analyzed. He did not think the symptoms warranted the diagnosis of tumor but of basic meningitis, which was slowly increasing and which was possibly of syphilitic origin. Mr. Fagge in reply said that the patient was so deaf and ill that he was unable to make her understand anything, but she volunteered the statement that things went round her. In answer to Dr. Milligan he said that no lumbar puncture had been performed.

A case of double ossiculectomy for chronic middle-ear suppuration. Shown by Mr. Lake.

The patient, a female aged thirty-three, had had scarlet fever when two years of age, with subsequent discharge from both ears. She was married at the age of fifteen; has had pneumonia, nephritis, and undoubted specific disease. The discharge from her ears has been practically continuous ever since. When examined, the right membrane was found destroyed, with the exception of a small outer rim. The left was perforated in its lower part and had a second perforation leading up to the antrum.

Local treatment was adopted for three months, but as pain, giddiness, and discharge were still complained of, the ossicles, the remains of the membrane, and the outer attic wall were removed under ether narcosis. Healing took place upon the right side in four weeks and shortly afterwards upon the left side.

Discussion.—Mr. CHEATLE asked how long the discharge had lasted and what was the cause. The PRESIDENT said the middle ears of the patient seemed very dry and satisfactory. He thought that one could not well foretell what the condition of the hearing would be after removal of the ossicles. Mr. HILL asked whether Mr. Lake had only practised ossiculectomy or whether he curetted the attic afterwards. Also whether Mr. Lake removed the outer attic wall under a general anæsthetic.

Dr. BRONNER asked whether insufflations of iodoform had been used six or seven times a day.

Mr. FAGGE asked whether Mr. Lake operated under a local anæsthetic.

Dr. MILLIGAN asked whether any preliminary antiseptic treatment had been adopted.

Mr. BULL said that the case could not be regarded as a true case of ossiculectomy, as Mr. Lake had burred away the outer wall of the attic.

Mr. CHEATLE said that they had come to the conclusion that the outer attic wall should be removed when ossiculectomy was performed.

Mr. LAKE in reply said that the discharge had lasted thirty years and that the original cause was scarlet fever. In performing ossiculectomy he always removed the outer attic wall and cleared out everything he could. He thought local anæsthesia insufficient in such cases. Previous antiseptic treatment had been employed for three months before any operation was attempted.

Patient upon whom the complete mastoid operation had been performed; subsequent epithelial grafting. Shown by Mr. HERBERT TILLEY.

In discussing this case Mr. BALLANCE said that Dr. Tilley had completed the operation by means of small epithelial grafts instead of opening up the wound again under a general anæsthetic.

He (Mr. Ballance) did not think that the question of giving the patient an anæsthetic a second time should enter into the decision. As Mr. Tracy had already mentioned, the appearance was not just as the pith of the communication indicated. There was a crescentic perforation in that portion of membrane which stretched across the deeper part of the meatus. This membrane was in the position of the membrana tympani, so that the scar-tissue membrane had grown up with a large perforation in its centre, through which pus was oozing. He did not think that the tympanum, the attic, or possibly a portion of the antrum had taken the graft. Probably the fault was not Dr. Tilley's, as the patient had gone away before the completion of the treatment. He thought that Dr. Tilley had not removed all the soft parts at the first operation. In performing the radical operation he advised complete clearing away of all the soft tissue.

In reply to Mr. Ballance's remarks Dr. TILLEY said that it was two and a half months since he had seen the patient. He (Dr. Tilley) applied several grafts. The patient insisted on returning to business before complete healing had taken place. He was sure that at the first operation all soft parts were completely cleared away. He brought forward the case as he considered it illustrated an alternative plan of dealing with the grafting process.

Mr. BALLANCE said that in cases where grafting was adopted the personal attention of the surgeon was necessary in order to secure a good result.

Notes of a case of primary sarcoma of the base of the skull in the position of the Eustachian tube. By Mr. ABBOTT.

New portable motor for surgical purposes. Demonstrated by Mr. BALLANCE and Dr. MILLIGAN.

The apparatus was specially designed for operations about the mastoid region. The motor was made so that it would stand firmly upon an ordinary table. It was about 1/12 of a horse power in strength and ran quietly and steadily. The speed could be regulated by a foot arrangement. The bur was attached to a flexible steel arm which enabled it to be used at a considerable distance from the motor. The hand piece was detachable and simple in construction. It could be taken off and sterilized.

THE NEW YORK OTOLOGICAL SOCIETY. REPORT OF THE MEETING OF JAN. 22, 1901.

By Dr. H. A. ALDERTON, Secretary.

VICE-PRESIDENT, DR. J. B. EMERSON, IN THE CHAIR.

Dr. WHITING presented a **case of sinus thrombosis,** reported from last meeting (boy from Norwich). Wound practically entirely healed. The patient was in good health and had gained in weight. The patient has perfect control of the jaw, notwithstanding the entire removal of the glenoid fossa and attachments of the inferior maxilla. Dr. Whiting reiterated his belief in the advantage of the use of the encephaloscope, to the aid of which he thinks the boy owes his life. The jugular was not tied, as it would have jeopardized the patient's life through the prolongation of the time of operation. Does not know whether there will be any regeneration of bone, but thinks it possible.

Discussion.—Dr. BERENS asked what was done with the dura and how Dr. Whiting overcame the hernia. Dr. WHITING : The hernia was very small. It partly retracted and partly became cicatricial. The dura cicatrized together. The aphasia has absolutely disappeared. Dr. J. L. ADAMS asked how the abscess healed up. Dr. WHITING : The walls came together and united. Dr. MARPLE asked whether there are any mental phenomena at present. Dr. WHITING : None, so far as he has been able to detect. Dr. DENCH has a case with emotional characteristics, a case of temporo-sphenoidal abscess. Thinks a hernia cerebri is always an evidence of tension ; when the abscess is thoroughly evacuated there is no hernia. In hernia there is probably always an abscess. Dr. WHITING has seen five cases of brain abscess ; in all there was hernia. He thinks they were all thoroughly evacuated. Dr. DENCH asked whether this was not simply necrotic tissue pushed out. Dr. WHITING: There was brain substance as well. Dr. EMERSON asked whether he would give the patient any mechanical protection. Dr. WHITING: A good idea; he should think of it. Dr. MCKERNON: A general surgeon in such a case had employed a rubber plate held in place by a band around the head.

Dr. BERENS **presented two specimens** prepared by Dr. E. S. Thompson, Pathologist of the Manhattan Eye and Ear Hospital. First: A specimen of a temporal bone with an anomalous facial nerve. The course across the upper part of the tympanum, the aqueductus Fallopii, was unusually prominent. Above the middle of the tympanic part was a foramen communicating with the superior semicircular canal. The facial nerve instead of bending down and slightly forward to its exit at the stylo-mastoid foramen, bent slightly down after leaving the tympanum and then forward at an angle of 45°, running almost parallel with the auditory canal. When nearly at the surface of the bone it bent down and made its exit from the stylo-mastoid foramen three or four millimetres more external than the foramen usually lies. In opening the mastoid cells it would have been almost impossible to avoid wounding the facial nerve. The other specimen was an infantile temporal bone showing the tympanum rather lower down than is usual and lying next the mastoid.

Discussion.—Dr. DENCH has noticed the same distribution of the cells as in first specimen while operating; and also the extension of the cells far into other regions. He thinks the tendency has been to confine our operation field to too small an area.

Dr. WHITING **presented set of mastoid gouges and chisels** of new pattern, with large handles.

Discussion.—Dr. FRIDENBERG has felt the need of just such instruments, especially in the Stacke operation. Dr. DENCH asked whether the large handle does not obscure the field of operation. Likes the length. Thinks the chisel is ground at a much better angle than the usual one. Dr. WHITING did not find any trouble from the large handle. Dr. A. H. KNAPP stated that Ballance uses a large and long chisel.

Dr. TOEPLITZ **presented a new lingual and a new faucial tonsillotome.**

Discussion.—Dr. FRIDENBERG asked whether the fork could be taken off and cleaned. Dr. TOEPLITZ: Very easily. Dr. QUINLAN thought the blades were not strong enough. Thinks the simplest instrument is the most perfect. Dr. Toeplitz did not find this objection to hold in actual use. The great advantage is that you do not have to use any pressure whatever.

Dr. Wilson reported a **case of tumor of the external auditory canal** in a young man, twenty-eight years old. In the right ear: it was purplish, hard, and nodulated. Measured 9 x 5 *mm*, on the posterior wall. Burned with nitric acid. Apparently eradicated. There was a recurrence. Reported epithelioma, on examination. Base had enlarged to 11 x 12 *mm*, but the principal extension had been inward and upward. No pain, no ulceration, no glandular enlargement. Dr. Wilson wished to know, if operation was thought advisable, how much tissue he would be justified in sacrificing.

Discussion.—Dr. Dench: All that is diseased, he should think. The growth is very happily located for removal. Dr. Whiting: Was there suppuration? Dr. Wilson: No. Tympanum intact. Dr. A. H. Knapp: Is the bone involved? Dr. Wilson: No. Dr. Whiting reported cases of epithelioma of the middle ear. No appearances to lead to a suspicion of malignancy, except enlargement of parotid gland. Radical operation. There was chronic suppuration of middle ear and mastoid process. Healed quickly. Pathologist reported case of epithelioma. Recurred. In two other cases, termination same. Advises non-interference. Dr. Kip thought these were cases of carcinoma. All such cases are, in his experience. Dr. Whiting: Pathologist so reported. Dr. Kipp advises against operation. Dr. Dench advised operation because he thought it was a case of fibro-sarcoma. In such cases a complete recovery may be brought about. In malignant (carcinomatous) growth of the outer ear, he has had one case that has not recurred in eight years. He has had other cases. If the tympanum is not involved, he should advise operation. Dr. Toeplitz reported a fatal case of carcinoma of the middle ear, involving the entire petrous bone. Dr. Wilson asked whether any of the gentlemen had had any experience of entire removal of the soft parts of the external ear. Dr. Whiting: Yes; tied common carotid before operation very luckily, even then the bleeding was tremendous. Dr. Berens believes in giving the patient a chance. Dr. Emerson spoke in favor of operation.

Dr. J. L. Adams spoke of the **sinking of the posterior, superior wall of the osseous canal.** Asked whether this symptom alone is sufficient to indicate operation in middle-ear suppuration.

Dr. **Dench** thought tenderness on deep pressure close to the auricle is usually present in these cases. Dr. **Adams**: There was no tenderness in these cases. Dr. **Gruening**: Sometimes you don't get tenderness, even sometimes when there is crepitancy due to thinness of cortex and distension. Dr. **Toeplitz** remembers one case, sudden cessation of suppuration with bulging as above. Incised swelling, and symptoms subsided. Dr. **Adams**: Always does this. Dr. **Quinlan** reported case relieved by such incision. Dr. **McKernon**: Any occlusion of cartilaginous canal, etc., or tenderness on traction? Dr. **Adams**: Yes. Dr. **McKernon** thought it a case of external otitis. Dr. **Alderton** spoke of a case in which this sinking of the posterior superior canal wall was a marked symptom. A remarkable point about this case was noted in that the healthy bone around the bone wound, after operation, became the color of skimmed milk—a bluish white—for quite an area afterwards. The patient was not anæmic; was a strong, healthy young woman. No sequestrum formed. Gradually the bone lost its blanched appearance and partook naturally in the healing process. Dr. **Whiting**: Had seen such an appearance in a very anæmic child. Case of sinus thrombosis with resection of jugular. Fatal. No reparative effort. Died of general sepsis.

Dr. **Berens** has used ethyl chloride as a local anæsthetic to do a mastoid operation, with good results.

Present.—Drs. Fridenberg, Emerson, Whiting, McKernon, Toeplitz, Brandegee, A. H. Knapp, Kip, Dench, J. L. Adams, Berens, Marple, Wilson, Quinlan, Hepburn, Gruening, and Alderton.

THE SECTION ON OTOLOGY OF THE NEW YORK ACADEMY OF MEDICINE. REPORT OF THE MEETING, JANUARY, 9, 1901.

DR. R. C. MYLES, SECRETARY.

DR. J. F. McKERNON, PRESIDENT, IN THE CHAIR.

Electrolysis in the destruction of organized strictures of the Eustachian tube. By J. A. KENEFICK, M.D. (Published in full in this issue, p. 73.)

Discussion.—Dr. WM. P. BRANDEGEE: All I can say corroborates the reader's experience. I had the pleasure of examining these cases, forty or fifty in number, with Dr. Kenefick, and while those reported are simply average cases, they are excellent examples, because the records of them have been kept very carefully.

There are several things to be said in favor of the electrical bougie. I would especially call attention to the painlessness of this method as compared with other bougies. The trauma incurred in using wire bougies is considerable. The pain to the patient is excruciating. When we compare the wire method and the electrolytic method, the latter is considerably more agreeable to the patient. The pain that follows the manipulation is very slight, at least, in my experience, only for some minutes. The patients have experienced great relief almost at once when the bougie has been successfully carried through to the middle ear, and it is astonishing that nearly all patients have declared that a wall has been removed and that some improvement set in almost immediately. This seems rather wonderful to me. I might say that we get the same result following the use of the wire or other bougies, but the easy manipulation, the painlessness of it, and the permanency of results are quite another thing. I have seen results which were so rapid that inside of ten days after the use of this instrument the hearing for whisper was increased marvellously. The patient himself says that in no other treatment has he experienced such remarkable relief. People of the lowest classes who have travelled around the clinics have expressed this great relief in the most glowing terms. The history of these cases shows that the results are rather brilliant on account of their permanency. There is nothing more to be said as far as I am concerned, but I trust that the discussion will be very open about it.

Dr. WENDELL C. PHILLIPS: When I first began the treatment of strictures of the Eustachian tubes by the method known as electrolysis, I was more or less sceptical as to its possibilities and to the results that might be obtained from its use. My scepticism has not yet entirely passed away, at the same time I have seen results in a few instances that certainly have been striking. About a year ago we placed in the ear clinic of the Manhattan Eye and Ear Hospital a complete outfit for doing this work. The patients at my clinic at the Post-Graduate Medical School and Hospital are also having the benefit of this form of treatment. Dr. Harris is giving his full attention to the treatment of these cases. We are keeping very careful records and at the proper time our results will be made known. So far, we are not studying results, but are giving most careful attention to treatment and records. I believe the apparatus we are using is an improvement over any formerly used. The Messrs. Wappler Bros., who have constructed this apparatus, seem to have filled all the requirements, and it, apparently, perfectly controls the current. I very soon found that one could vary the strength of the current by making more or less pressure of the hand electrode, and have had an electrode constructed that slipped over the wrist and gives equal pressure all the time. This is certainly a distinctive action in the method of the work. We also use a low voltage, rarely using more than fifteen or sixteen volts of the current. With this voltage I cannot see how any harm can be done to the tissues when intelligently used. The mere fact that you add a perfectly controlled current of electricity to the presence of a gold bougie should have no damaging effect upon the tissues. Some precautions are necessary in using the street current, as it is possible to make short circuits through gas fixtures or Croton-water pipes. The patient should be instructed not to touch these while the current is being used, or, on the other hand, these near-by fixtures should be insulated. I believe the apparatus constructed for our clinic is now coming into general use.

Dr. W. K. SIMPSON: I have used electrolysis a great deal,—almost daily in my practice—and although my results as to the increase in hearing have not been as brilliant as have been reported here.to-night, I can say, however, that I think it is the only method we have by which we can overcome strictures in the Eustachian tube. I think that the introduction of this line of treatment has revolutionized the whole subject of stricture of the Eustachian tube. In my experience we cannot always tell by the character of the sound we get through the diagnostic tube whether we have a stricture or not. I have repeatedly experienced what has seemed to my ear to be a most perfect sound, as if the air went thoroughly into the tympanic cavity. It has been a surprise to me at times, after getting a very full sound through inflation, to find, in passing a bougie, a stricture very near the proximal end of the tube. So I think in that respect the only real positive means we have of diagnosing stricture is by passing the bougie. My experience has been that the majority of the strictures occur about one inch within. I always attempt to pass the Eustachian catheter with the aid of the rhinoscopic mirror, having the patient press the tongue, and passing the catheter through the nose; we can then see the end of the Eustachian catheter pass in the Eustachian tube. By that means we know absolutely where we are. We all know that we can inflate the Eustachian tube without the catheter being exactly in the orifice, but if we see the catheter enter by means of the mirror we know where it is and we gain a considerable distance. We can gain frequently as much as ⅛ to ¼ of an inch, and I think that this is a very valuable point to consider. In electrolysis I am accustomed to use the hard-rubber catheter, which is entirely insulated.

Recurrence of stricture, I think, happens quite frequently. That has been my experience, and I think it a good plan, after electrolysis, to pass an ordinary Eustachian bougie in order to keep up the dilatation.

In relation to the sequelæ I have never seen any trouble except once where middle-ear disease followed electrolysis. Exactly why it happened I do not know, as all the laws of asepsis were observed.

I did not hear the beginning of this paper, and ask if the speaker will mention just the size of the tube he uses. In that regard I may be at fault in not getting a permanent result. I generally use a small size and dilate subsequently. In two instances I passed the second size into the Eustachian tube as far as I could and was unable to get it out. I was in quite a predicament to know what to do. I tried electrolysis but it did not answer, and simply got it out by the use of strong traction force. In conclusion I can only say that I think Eustachian electrolysis has opened up a broad and new field in the subject of Eustachian stricture and we are sure to eliminate one great cause in middle-ear deafness.

Dr. T. P. **Berens** : I should like to congratulate Dr. Duel upon one of the greatest advances in the treatment of deafness associated with Eustachian disease, and to congratulate the reader on his success with this method.

In regard to instrumentation I have from the first adopted the hard-rubber catheter. It is easily disinfected. It is easily bent by the use of heat, and the objection that has been raised to it, namely, that of warming under the current, I have not yet noticed.

Dr. Simpson called attention to a certain class of cases that I have met with quite frequently, namely, those in which we appear to get a complete inflation by the use of the diagnostic tube so far as our own hearing goes. In many of these cases inspection reveals that the membrana tympani is in exactly the same position when we use the catheter.

In regard to recurrence of stricture after dilatation, it has been my misfortune to have a recurrence, although it was longer delayed than after the use of the old-fashioned bougie. I mean by that from two or three to five or six months.

With regard to the difference in pain I must disagree decidedly with Dr. Brandegee. The old-fashioned bougie used with the same caution and slowness in my experience has not caused more pain than electrolysis. If the stricture is very tight, the old-fashioned bougie will cause, under the most gentle pressure, about the same amount of pain as the current. It is not my habit to use more than five milliampères. I find this thoroughly sufficient.

Dr. **Robert Newman** : Electro-therapeutics should be more taught by our colleges and used by the profession, and there is not the slightest doubt in my mind that strictures of any kind, and particularly of the Eustachian tube, can be cured by electrolysis. Permit me to show you the instrument which I have had constructed for this purpose. The catheter is introduced into the Eustachian tube with great care, till the stricture arrests its progress. When it is attached to the negative pole of the galvanic battery, the patient takes in his hand as a positive pole a moistened pad or handle. The current is very slowly increased from zero, according to the toleration of the patient, but, as a rule, should not be stronger than five milliampères. The operator very gently guides the inner tube as the electrode and pushes it forward only when the electrolytic current has absorbed the obstructions. Too much in one séance must never be done. Undue force must never be used; the electrolysis must do the work of absorption. The milliampère meter is a necessity. The current must be steady, slowly increased, and before removal of the catheter slowly decreased to zero. The catheter fully introduced is not longer than any of the usual Eustachian catheters.

Now treatment and cure by electrolysis is entirely a chemical action of the electric current and nothing else, whereby the pathological tissues are absorbed. I must decidedly object to the names and action of electrolysis which have been used and stated in literature and also by some speakers here to-night. Electrolysis is *no dilatation.* Dilatation is a certain kind of pressure or force. As soon as you use pressure with electrolysis you prevent the action of electrolysis. You push the instrument through the stricture by force. The instrument must be gently handled and guided as most aurists do, and there we have only the electric chemical action by absorption, and the negative electrode will pass forward, through the stricture. There is *no* cauterization. Some confound galvanic cauterization and electrolysis. Electrolysis is only an absorption. The effect of electrolysis depends entirely on the strength of the current used. A weak current never cauterizes. A strong current cauterizes and may destroy tissues. If many gentlemen, particularly some of my friends in the country, use thirty to forty milliampères they certainly must destroy tissue. I never use more than five milliampères either in the stricture of the urethra or in the ear. Sometimes two milliampères will do. The voltage does not make any difference, as it is nothing but the pressure with which electricity comes from the galvanic battery. The strength to be used must be regulated by milliampères; two and a half milliampères may be sufficient according to the effect produced and the sensation of the patient. I have seldom used more than four, never more than five milliampères. Therefore there is no dilatation, no cauterization ; it is a chemical absorption by electrolysis.

Then some of my friends say it burns. The current used is lower than the natural heat of the body and such a temperature cannot burn ; if the operator burns, it is malpractice !

About the pain. The electric current necessary cannot cause any pain, but it may be induced by passing the electrode with force or over denuded surfaces. By the electrolytic action and by handling gently, as you all do, *no* pain is caused.

Of course we must take the negative pole to the stricture. We must use the battery having little cells, small surface of elements, and we do best to have our own apparatus, our own galvanic battery. If we cannot use the battery according to our own ideas, the next best is the Leclanche cells, enabling us to regulate the current by single cells. The current from the street is not reliable. It does not give the fine electric action; besides we do not know what may happen at the power house, where the engineer changes the current to suit his wants. We have the current not in our hands and the patient may get a shock, which is very dangerous to anyone with deafness.

The current must be weak and not continued too long. At best I would not continue it longer than five minutes. Next the external resistance must be regulated. One speaker said he uses the electric catheter in the Eustachian tube and puts the positive pole on the ear externally. I consider that a mistake. If the electricity travels a long distance in the body we can give more current and apply this to the body of the patient. Electricity travels by the shortest road, which concentrates the strength, and too near to the origin of cerebral nerves, causes disturbances to the brain and nerve of sensation, like flashes to the eyes, shocks, metallic taste, etc. Therefore I place the positive pole in the hand of the patient and only then inverse the electric current from zero, cell by cell, until I have the desired amount. These applications must not be given too frequently; no interference must be allowed between operations. Five to six days or a week I consider a good interval. In one particular instance when I had used electrolysis in a stricture of the urethra, I know that a doctor played a trick on me, by using instruments in the urethra after my application, which destroyed the electrolytic action and prevented a success.

Now about relapses: I have treated about two thousand cases of stricture of the urethra and have never yet found on examination any relapse. If the stricture is treated well, with care, and cured, I have never seen a patient come back with a stricture in the same place. But if there is a cauterization or interference, of course there will be a cicatrization. A scar will never be made by electrolysis when correctly applied, and electrolysis will not injure the mucous lining.

There are certainly many cases on record where strictures of the urethra and other strictures have been treated with bad results. But such results are the fault of either the operator's undue pressure, bad instruments, or incorrect batteries. If you use the right instruments, gently handling the same, so that electricity only works, and not pressure, there will be no trouble. That is one of the reasons why I object to calling the action a *dilatation.* If the operation is done correctly there is No dilatation, No cauterization. No burning, No pain, No relapse—(at least in the urethra)—but the stricture is cured by an enlargement of the calibre through the chemical absorption of the pathological tissues by electrolysis of the galvanic (constant) current of the negative pole—which latter electrode must be a metal which is not itself decomposed by the electrolysis.

They may come back with another disease of the bladder, prostate, urethra, etc., but I have never seen a relapse of urethral strictures if electrolysis was properly applied.

Dr. A. B. DUEL: It has been very gratifying to me to hear this paper and all this discussion on a subject which is so interesting to me, and for which, in a way, I may be said to be responsible. Not that I wish to claim priority in the use of electrolysis in the Eustachian canals, but it has been due to the perfection of the technique and to the insistance on my part on the usefulness of this procedure in the relief of stricture of the Eustachian canal that so many otologists have made use of it.

As to the instrument which Dr. Newman has shown, one has simply to look at the size of it to understand that it could be pushed only a short distance into the mouth of the Eustachian tube, and that it could not possibly be passed even as far as the isthmus. Many strictures occur before this is reached, and I have no doubt that many such cases which have come under Dr. Newman's care have found a great deal of benefit from the instrument he uses.

Stevenson, of London, in his history of eight cases, covering a period of two or three months, reports some success in treatment and speaks of having used a bougie which was protruded from the end of the catheter about one inch.

I must give all credit to Dr. Newman for suggesting the use of electrolysis to me, because the fact that I had had repeated success in using it in strictures of the urethra, as detailed by him, led me to think of using it in the Eustachian canal, and with a better knowledge of the length of the Eustachian canal, and the size of, it I constructed my bougies I have insisted that the bougie in all cases should be passed into the tympanum. Those who have used it very much have seen that there are often strictures at the isthmus and beyond it which could not be reached by this instrument of Dr. Newman, or that of Stevenson. I believe it is entirely due to this technique that I and many others have been enabled to report so many successful cases.

To those of us who have made use of the catheter intelligently for several years, electrolysis of the Eustachian tube for the relief of stricture is a thing which has come to stay, and we all feel in our own mind that it is a useful procedure which can not be dropped; that it is to the relief of stricture of the Eustachian canal what the improvement by the introduction of the catheter in its inflation was to the Politzer method of inflation.

In regard to the technique, several gentlemen have made use of, and try to justify their position in using, the rubber catheter for the purpose of insulation. I have tried it and have given it up, preferring the pure silver catheter, which can be so much more effectually sterilized by boiling, more easily bent to fit accurately in the mouth of the Eustachian tube, and easily insulated by the rubber tissue wound about it in the manner exhibited in the catheter which is being passed around.

In regard to the use of the bougie which has been insulated up to the bulb, I have never thought it necessary to use it.

The current strength which is indicated on the milliampère-meter always is the current strength which comes from the point of closest contact with the tissues, because that is the point of least resistance to the current. This, naturally, is at the point of the stricture where the bulbous head of the bougie comes in contact with it. Of course the current in lesser strength comes from every point of contact with the other portions of the tube, but as it is quite probable that the whole mucous lining of the Eustachian canal is somewhat thickened, I have always thought that it was more than likely that mild electric action, which was obtained by the contact of the wire with the portion of the tube, was a useful one.

In regard to the time of application of electricity, I agree perfectly with Dr. Newman, never using a contact for more than five minutes nor a current strength of more than five *m. a.*

In regard to voltage, I feel certain that the use of a high voltage to obtain a certain current strength causes more pain to the patient than would be caused by obtaining the same amount of current with a low voltage.

In regard to recurrence of the stricture, the same causes which produced the primary stricture will naturally produce it again if treatment is not kept up. I do not think that stricture which has once been done away with by using electric action, will return, but others may return from the same causes which produced the first one. The use of electrolysis for the relief of Eustachian obstruction is not all that is necessary in the treatment of catarrhal otitis media, although the opening of the Eustachian tubes, thus ventilating the middle ear, is probably the most important thing to be done in such a condition. In cases of sclerotic form of otitis media, the chance of improvement is very slight as compared with those cases where most of the damage is in the Eustachian tube.

I wish to call your attention to one more point. The use of electricity is unfortunately one of the chief resources of many charlatans. It is liable to be looked upon by many in the medical profession as well as by intelligent members of the laity with a certain amount of suspicion. Many practitioners, either because they have not investigated the usefulness of electricity at all, or because they have not met with success after trying it for a short time without any knowledge of it, have given it up as useless. It seems to me that all otologists who make use of it ought to be very careful to explain to those who come under their care, and to members of the profession, that we are making use of it simply to accomplish a mechanical result, to effect a reabsorption of certain thickenings, and that we are not using electricity for the cure of all forms of deafness.

I may have spoken with too much confidence in this matter of electrolysis, but if I have done so it is with the confidence born of success after the successful treatment of scores of cases which have come under my care after failure at the hands of prominent otologists all over this country.

Dr. **Emil Gruening** : I have not used electrolysis, but as you have also called upon those who have not used electrolysis in the Eustachian tube to take the floor, I want to make a few remarks. I am not convinced. I was sceptical when I came here and shall go home more sceptical than when I came. Dr. Kenefick read his paper most admirably, but in this paper are merely positive assertions but no proof. He read the cases of several patients, but there are lacking the data of the functional and physical examination of these cases before and after the electrolytic treatment. The statements made in these seven cases are too general. When such a discovery marking an epoch is proclaimed we are entitled to demand scientific proof. The remarks of Dr. Duel are also general assertions. The proof is lacking. What the profession and laity want to know are facts, and these are lacking.

Dr. **A. B. Duel** : I should like to call Dr. Gruening's attention to the fact that two years ago I published a report of fifty cases from hospital and private practice which had been under my care for a considerable period. For more than a year previous to the publication I had devoted all my time and attention at the New York Eye and Ear Infirmary, to this work, and had only cases of this character sent to me. In all these fifty cases a functional examination was made before the treatment was instituted, and afterward at intervals of from one to several months. For the convenience of those who read the paper a tabulated report of these functional examinations was appended, and if Dr. Gruening cares to look that over he will find some statistics which will doubtless convince him that the claims which were made for the usefulness of the electrolytic bougie were not entirely groundless, nor based upon unscientific examinations.

Dr. **W. K. Simpson** : I would like to ask for information on one point especially. As undoubtedly all Eustachian tubes are not of the same length, how are we to know that we are in the tympanic cavity. I should like to ask the reader of the paper to answer that. It is important to know what length we are to go.

Dr. **J. L. Adams** : When I bought an outfit for electrolysis I got four bougies, and two of them were so large that I have never been able to use them in any case. The two small ones I have always used.

Dr. **H. Knapp** : I know but little about the subject. I am, however, not inclined to be so negative as Dr. Gruening. While listening to the paper I thought it was very ably and nicely put. If it furnished no proofs of exact measurements of the function of the ear, it recorded, in some cases, an improvement of hearing, which struck me as very remarkable. I do not think that in a science which is forming we should exact mathematical proof. It would be better, of course, if we could get it, but if we obtain only a reasonable encouragement in the treatment of so hopeless an affection as chronic middle-ear catarrhs, we should accept it with gratitude.

Dr. EDWARD B. DENCH: I feel very much obliged that this work has been carried out in my clinic and I think that the histories have been most carefully kept. Certainly every care was taken to make the work as scientific and careful as possible. I personally have used this method comparatively little and have but a limited personal experience with this method. It seems to me that the great aim is the relief of any obstruction which may be found in the tube. I do not think it makes any material difference whether you do that by means of the electric bougie or with some other bougie, if you only get a result. I state this only as a matter of experience.

I must disagree with Dr. Brandegee in one point, that is, that the simple bougie as used formerly is always painful and the electric bougie entirely free from pain. I have heard several patients state that the electric bougie was slightly less painful, but I have never heard any complaint of very severe pain, if the simple bougie was carefully used. The particular instrument which you do use for this purpose is not of much importance. A good many years ago I used a bougie similar to the one presented by Dr. Kenefick, that is, a metal bougie, and I found that it caused considerable pain. I discarded metal bougies and used the simple method with which many of my friends are acquainted. The bougie consists of a piece of No. 5 piano wire of sufficient length to project about one and three-fourth inches beyond the end of the Eustachian catheter. The distal end of the wire is bent flat upon itself for a length of one-sixteenth of an inch, and the bent portion is wound firmly with sterile cotton. This device has proven efficacious in my hands, but it does not make much difference what instrument is used. When the electrolytic method is used, you are dealing with such a small quantity of electricity that it must be distributed all through the shank of the bougie, as Dr.

Duel says, and there must be short circuiting through the catheter, so that the action of the current must be very slight in these cases.

In regard to recurrence of obstruction in these cases I have certainly seen tubes that have not been thoroughly cleared by means of electrolysis, and in two cases I found the tubes just as much stopped after treatment as they were before. I remember at least two cases where great improvement had been supposed to follow the use of the electric bougie, and I found that the hearing was the same as after simple catheter inflation. I don't understand the amount of improvement which we get from the use of the electric bougie in tubes that are open. I must disagree with Dr. Simpson in the statement that the use of the diagnosis tube does not always give information as to the condition of the Eustachian tube.

In the cases of great improvement in hearing following the use of the electric bougie where the Eustachian tube has been perfectly patent, is it not possible that we have to do here with a simple vascular condition of the Eustachian tube? We may have a certain condition of vaso-motor paresis in the tube, and a sudden increase in the hearing following the use of the bougie might be explained by supposing that the vaso-motor tone of the vessels was restored either by mechanical stimulation due to the presence of the instrument or the action of the galvanic current.

There is always great danger of drawing a wrong deduction, even if the most careful notes are made. A few days ago a patient came to my clinic with a history of progressive impairment of hearing extending over several years. The whisper was heard seven feet upon the right side and eight feet upon the left. Catheter inflation showed slight narrowing of the right Eustachian tube but did not greatly improve the hearing in either ear. When I next saw the patient, about a week later, the whisper was heard in the right side at a distance of twenty feet. Had the electric bougie been used the deduction drawn would certainly have been misleading.

What I have said should not detract at all from the magnificent work Dr. Duel has done. I think we all have learned something about the subject from the paper, but I do not think that it is wise to go on too rapidly. Make haste slowly. All scientific facts will be gladly accepted by every member of the Society and every member of the profession.

President Dr. James F. McKernon: I would like to add a few words regarding this treatment in support of the gentlemen who have spoken and of the reader of the paper. One of the gentlemen mentioned the possibility of bad results. I have seen two bad results in the use of this method. One has been in my own practice, one in the practice of a gentleman outside of the city who used this treatment. In each case it caused acute otitis. In the case under my own personal observation, the accident, as far as I know, was not caused by lack of asepsis, but in all probability by the too rapid passing of the bougie through a rather tight stricture. There was contact with the drum membrane; it passed directly into the middle ear. Six hours afterwards the patient complained of no pain whatever. At the end of eight hours pain was complained of, and I saw a distinct hyperæmia over the membrane and around the tympanic orifice of the Eustachian tube. At the end of eight more hours there was serous fluid in the middle ear, which I immediately liberated.

The other case came under my observation four days after the rupture had taken place. The doctor described this case to me as a somewhat similar one. Those have been the only cases that have come under my observation where bad results have arisen in using this method. I have used this method a great deal during the last four years.

I certainly am able to get better results with this method of treatment than I was with the old method. One may become more accustomed to it by using a certain technique of the instrument. I gave the other method a trial but I did not have the same results, although I passed through into the tympanum in nearly every case. There is one point the reader of the paper might have brought out. Any physician who expects to get the apparatus should be very careful that the bougies are long enough, because certain of them are too short and such ones cannot be passed into the middle ear. In several instances gentlemen who have used this method out of town had complete failures, and when they sent me the bougies I found that none of them had passed through and gotten into the tympanum, owing to the shortness of the bougie. You may find that in one catheter the bougie is plenty long enough, but in another catheter it is not long enough to reach the middle ear.

With regard to recurrence, there are recurrences in the same patient and the same tube if not at the same place. Here we simply have to take into consideration the fact that when we overcome the stricture it may recur at that point or it may recur at some other point, provided the catarrhal condition that caused the primary narrowing be not cured.

Regarding the amount of pain : my patients certainly have not had as much pain as they had with the old method ; it may be because I use a little more cocaine or more care, or have become accustomed to its use. I have used the new method more than the old one, and have never known the patients to complain of pain after the sitting was over.

I wish to mention just one more point which the reader did not bring out, and that is the moistening of the electrode. Dr. Duel has mentioned in his other papers that by using ammonia water the electric action seems to have a little more rapid effect than if plain water were used.

In all of those cases which have been treated by this method in my clinic by Dr. Duel, Dr. Kenefick, and myself, and in my own practice, a functional examination was made, and in every case the history has been kept. The patients have been functionally tested before and after the treatment. If you cannot call this distinct and definite from the standpoint of examination, I don't know what is so.

One should be very careful with regard to the electrical part of it, using no more than 30 to 40 volts, very rarely over 2½ milliampères, and contact anywhere from two to four minutes.

The greatest care should be employed in passing the bougie through the tube and as little force as possible employed. Whatever the action on the tissues may be, whether a simple stimulus to the circulation, and this in turn stimulating the efferent vessels to greater activity, or a distinct chemical action, the clinical fact remains that we are enabled to open the tube and benefit our patients far more than when the older method was used.

Mr. J. J. Carty : I was much interested in the discussion. But I have been impressed with the little amount of attention that has been given to the main agent used here, which is electricity. The method of handling the bougie and the other apparatus has been discussed fully, but when it comes to the use of the agency, if I were asked to construct the apparatus I would not know how to go about it, were I to depend upon what I have heard to-night.

I heard it mentioned by one speaker that 35 volts should be used; by another, Dr. Newman, that 4 volts should be employed;

some one else is in favor of 10 volts. The current employed seems to be about 5 milliampères. These discrepancies in voltage indicate lack of precision in an important matter. I think it well to sound a note of warning to those who intend to repeat the experiment that they should look exactly to the electrical condition of the apparatus which they have employed.

In speaking of voltage, we should distinguish between the voltage of the battery upon open circuit and the voltage of the battery upon a closed or operating circuit. This latter voltage is really its effective voltage, and in many cases will be lower than the nominal voltage on open circuit. We might have a battery giving 35 or 40 volts on open circuit, but when tested upon a closed circuit the voltage might be reduced to 5 or less. This may account for the discrepancies in the voltage noted in the discussion, but it is a vital point and should be carefully looked to.

I think Dr. Kenefick, from the results which he has obtained, must have employed a very happy arrangement of circuits, but from my knowledge of currents obtainable from dynamos I should not wish to have such a current applied to my ear. I think by all means, for such delicate operations as this, we should have a battery under our own control, the total output of which could not do any harm. I think Dr. Newman's idea of having one of the electrodes in the hand, thus nicely interposing a very large resistance, is not a bad one, especially where sources of current of large possible output are employed. This large resistance would tend to keep down currents below the dangerous limits. Some one has spoken of the melting of electrodes. If such a thing could happen, this extra resistance of the body would prevent it.

In using a battery for such operations as this, its internal resistance should be taken into account. A battery with a high internal resistance would give the same voltage on open circuit as a battery of the same number of cells having a low internal resistance, but upon a closed circuit—that is, when applied to the patient, the effective voltage of the high-resistance battery would be much lower than that of the low-resistance battery. Thus, in an operation calling for a given voltage, measurements made upon open circuit would indicate that that voltage had been obtained, but when actual work is being done the voltage might be very different and discordant results would be obtained, and failure might be reported, which would be laid up against the operation itself, although really due to defective electrical circuits.

Five milliampères seem to be the current required for this operation. This current can be obtained with a high voltage or a low voltage. If a high voltage is employed, as much of the resistance of the body as necessary must be interposed in order to reduce the current to its proper strength. Where a low voltage is employed, less body resistance must be used. Thus if one pole of the battery were placed in the ear and the other pole attached to a napkin wet with a conducting solution and wrapped around the neck, it would be an arrangement permitting the employment of the minimum number of volts. Consequently a smaller battery might be employed, which might be of advantage where portability is to be considered. The use of a low voltage battery would also diminish the tendency to giving shocks.

I have been impressed with the vagueness of the electrical data given in this discussion, and feel that where failure is reported from this operation it cannot be ascribed to the method itself until it has been rigorously demonstrated that the proper electrical methods have been followed.

Dr. J. A. KENEFICK—Concluding remarks: One thing I forgot to say was that this is a substance made of ether and celluloid by the celluloid manufacturers, which they claim will coat and insulate the bougie. It is insulated by simply dipping it into the solution. The objection to it in my mind is that it is liable to crack off within the tube.

Dr. Simpson asked about the length of the bougie. To my mind the proper length is 1½ inches beyond the end of the catheter. He asked when we know that we are in the tympanic cavity. I said one ought in time to acquire such a touch that he would know by the length of the wire and feeling of it just where he is. I have already described the feeling of the end of the bougie in the tympanic cavity.

In regard to Mr. Carty's suggestion as to the apparatus, we must say we accept the apparatus from the instrument makers and expect it to do what they claim it does.

With regard to the size of the bougie, various sizes were used at first as a matter of convenience, but we found by experience that by the smaller-sized bougie we can get in easier than by a larger one. We now use a bougie of one *mm*, and find that that answers the purpose for most cases.

So much has been said that I cannot expect to cover the whole ground.

Now about relapses: I have treated about two thousand cases of stricture of the urethra and have never yet found on examination any relapse. If the stricture is treated well, with care, and cured, I have never seen a patient come back with a stricture in the same place. But if there is a cauterization or interference, of course there will be a cicatrization. A scar will never be made by electrolysis when correctly applied, and electrolysis will not injure the mucous lining.

There are certainly many cases on record where strictures of the urethra and other strictures have been treated with bad results. But such results are the fault of either the operator's undue pressure, bad instruments, or incorrect batteries. If you use the right instruments, gently handling the same, so that electricity only works, and not pressure, there will be no trouble. That is one of the reasons why I object to calling the action a *dilatation.* If the operation is done correctly there is No dilatation, No cauterization. No burning, No pain, No relapse—(at least in the urethra)—but the stricture is cured by an enlargement of the calibre through the chemical absorption of the pathological tissues by electrolysis of the galvanic (constant) current of the negative pole—which latter electrode must be a metal which is not itself decomposed by the electrolysis.

They may come back with another disease of the bladder, prostate, urethra, etc., but I have never seen a relapse of urethral strictures if electrolysis was properly applied.

Dr. A. B. Duel: It has been very gratifying to me to hear this paper and all this discussion on a subject which is so interesting to me, and for which, in a way, I may be said to be responsible. Not that I wish to claim priority in the use of electrolysis in the Eustachian canals, but it has been due to the perfection of the technique and to the insistance on my part on the usefulness of this procedure in the relief of stricture of the Eustachian canal that so many otologists have made use of it.

As to the instrument which Dr. Newman has shown, one has simply to look at the size of it to understand that it could be pushed only a short distance into the mouth of the Eustachian tube, and that it could not possibly be passed even as far as the isthmus. Many strictures occur before this is reached, and I have no doubt that many such cases which have come under Dr. Newman's care have found a great deal of benefit from the instrument he uses.

Stevenson, of London, in his history of eight cases, covering a period of two or three months, reports some success in treatment and speaks of having used a bougie which was protruded from the end of the catheter about one inch.

I must give all credit to Dr. Newman for suggesting the use of electrolysis to me, because the fact that I had had repeated success in using it in strictures of the urethra, as detailed by him, led me to think of using it in the Eustachian canal, and with a better knowledge of the length of the Eustachian canal, and the size of, it I constructed my bougies I have insisted that the bougie in all cases should be passed into the tympanum. Those who have used it very much have seen that there are often strictures at the isthmus and beyond it which could not be reached by this instrument of Dr. Newman, or that of Stevenson. I believe it is entirely due to this technique that I and many others have been enabled to report so many successful cases.

To those of us who have made use of the catheter intelligently for several years, electrolysis of the Eustachian tube for the relief of stricture is a thing which has come to stay, and we all feel in our own mind that it is a useful procedure which can not be dropped; that it is to the relief of stricture of the Eustachian canal what the improvement by the introduction of the catheter in its inflation was to the Politzer method of inflation.

In regard to the technique, several gentlemen have made use of, and try to justify their position in using, the rubber catheter for the purpose of insulation. I have tried it and have given it up, preferring the pure silver catheter, which can be so much more effectually sterilized by boiling, more easily bent to fit accurately in the mouth of the Eustachian tube, and easily insulated by the rubber tissue wound about it in the manner exhibited in the catheter which is being passed around.

In regard to the use of the bougie which has been insulated up to the bulb, I have never thought it necessary to use it.

The current strength which is indicated on the milliampèremeter always is the current strength which comes from the point of closest contact with the tissues, because that is the point of least resistance to the current. This, naturally, is at the point of the stricture where the bulbous head of the bougie comes in contact with it. Of course the current in lesser strength comes from every point of contact with the other portions of the tube, but as it is quite probable that the whole mucous lining of the Eustachian

Now about relapses: I have treated about two thousand cases of stricture of the urethra and have never yet found on examination any relapse. If the stricture is treated well, with care, and cured, I have never seen a patient come back with a stricture in the same place. But if there is a cauterization or interference, of course there will be a cicatrization. A scar will never be made by electrolysis when correctly applied, and electrolysis will not injure the mucous lining.

There are certainly many cases on record where strictures of the urethra and other strictures have been treated with bad results. But such results are the fault of either the operator's undue pressure, bad instruments, or incorrect batteries. If you use the right instruments, gently handling the same, so that electricity only works, and not pressure, there will be no trouble. That is one of the reasons why I object to calling the action a *dilatation.* If the operation is done correctly there is No dilatation, No cauterization. No burning, No pain, No relapse—(at least in the urethra)—but the stricture is cured by an enlargement of the calibre through the chemical absorption of the pathological tissues by electrolysis of the galvanic (constant) current of the negative pole—which latter electrode must be a metal which is not itself decomposed by the electrolysis.

They may come back with another disease of the bladder, prostate, urethra, etc., but I have never seen a relapse of urethral strictures if electrolysis was properly applied.

Dr. A. B. DUEL : It has been very gratifying to me to hear this paper and all this discussion on a subject which is so interesting to me, and for which, in a way, I may be said to be responsible. Not that I wish to claim priority in the use of electrolysis in the Eustachian canals, but it has been due to the perfection of the technique and to the insistance on my part on the usefulness of this procedure in the relief of stricture of the Eustachian canal that so many otologists have made use of it.

As to the instrument which Dr. Newman has shown, one has simply to look at the size of it to understand that it could be pushed only a short distance into the mouth of the Eustachian tube, and that it could not possibly be passed even as far as the isthmus. Many strictures occur before this is reached, and I have no doubt that many such cases which have come under Dr. Newman's care have found a great deal of benefit from the instrument he uses.

Stevenson, of London, in his history of eight cases, covering a period of two or three months, reports some success in treatment and speaks of having used a bougie which was protruded from the end of the catheter about one inch.

I must give all credit to Dr. Newman for suggesting the use of electrolysis to me, because the fact that I had had repeated success in using it in strictures of the urethra, as detailed by him, led me to think of using it in the Eustachian canal, and with a better knowledge of the length of the Eustachian canal, and the size of, it I constructed my bougies I have insisted that the bougie in all cases should be passed into the tympanum. Those who have used it very much have seen that there are often strictures at the isthmus and beyond it which could not be reached by this instrument of Dr. Newman, or that of Stevenson. I believe it is entirely due to this technique that I and many others have been enabled to report so many successful cases.

To those of us who have made use of the catheter intelligently for several years, electrolysis of the Eustachian tube for the relief of stricture is a thing which has come to stay, and we all feel in our own mind that it is a useful procedure which can not be dropped; that it is to the relief of stricture of the Eustachian canal what the improvement by the introduction of the catheter in its inflation was to the Politzer method of inflation.

In regard to the technique, several gentlemen have made use of, and try to justify their position in using, the rubber catheter for the purpose of insulation. I have tried it and have given it up, preferring the pure silver catheter, which can be so much more effectually sterilized by boiling, more easily bent to fit accurately in the mouth of the Eustachian tube, and easily insulated by the rubber tissue wound about it in the manner exhibited in the catheter which is being passed around.

In regard to the use of the bougie which has been insulated up to the bulb, I have never thought it necessary to use it.

The current strength which is indicated on the milliampèremeter always is the current strength which comes from the point of closest contact with the tissues, because that is the point of least resistance to the current. This, naturally, is at the point of the stricture where the bulbous head of the bougie comes in contact with it. Of course the current in lesser strength comes from every point of contact with the other portions of the tube, but as it is quite probable that the whole mucous lining of the Eustachian

Now about relapses: I have treated about two thousand cases of stricture of the urethra and have never yet found on examination any relapse. If the stricture is treated well, with care, and cured, I have never seen a patient come back with a stricture in the same place. But if there is a cauterization or interference, of course there will be a cicatrization. A scar will never be made by electrolysis when correctly applied, and electrolysis will not injure the mucous lining.

There are certainly many cases on record where strictures of the urethra and other strictures have been treated with bad results. But such results are the fault of either the operator's undue pressure, bad instruments, or incorrect batteries. If you use the right instruments, gently handling the same, so that electricity only works, and not pressure, there will be no trouble. That is one of the reasons why I object to calling the action a *dilatation.* If the operation is done correctly there is No dilatation, No cauterization. No burning, No pain, No relapse—(at least in the urethra)—but the stricture is cured by an enlargement of the calibre through the chemical absorption of the pathological tissues by electrolysis of the galvanic (constant) current of the negative pole—which latter electrode must be a metal which is not itself decomposed by the electrolysis.

They may come back with another disease of the bladder, prostate, urethra, etc., but I have never seen a relapse of urethral strictures if electrolysis was properly applied.

Dr. A. B. DUEL: It has been very gratifying to me to hear this paper and all this discussion on a subject which is so interesting to me, and for which, in a way, I may be said to be responsible. Not that I wish to claim priority in the use of electrolysis in the Eustachian canals, but it has been due to the perfection of the technique and to the insistance on my part on the usefulness of this procedure in the relief of stricture of the Eustachian canal that so many otologists have made use of it.

As to the instrument which Dr. Newman has shown, one has simply to look at the size of it to understand that it could be pushed only a short distance into the mouth of the Eustachian tube, and that it could not possibly be passed even as far as the isthmus. Many strictures occur before this is reached, and I have no doubt that many such cases which have come under Dr. Newman's care have found a great deal of benefit from the instrument he uses.

Stevenson, of London, in his history of eight cases, covering a period of two or three months, reports some success in treatment and speaks of having used a bougie which was protruded from the end of the catheter about one inch.

I must give all credit to Dr. Newman for suggesting the use of electrolysis to me, because the fact that I had had repeated success in using it in strictures of the urethra, as detailed by him, led me to think of using it in the Eustachian canal, and with a better knowledge of the length of the Eustachian canal, and the size of, it I constructed my bougies I have insisted that the bougie in all cases should be passed into the tympanum. Those who have used it very much have seen that there are often strictures at the isthmus and beyond it which could not be reached by this instrument of Dr. Newman, or that of Stevenson. I believe it is entirely due to this technique that I and many others have been enabled to report so many successful cases.

To those of us who have made use of the catheter intelligently for several years, electrolysis of the Eustachian tube for the relief of stricture is a thing which has come to stay, and we all feel in our own mind that it is a useful procedure which can not be dropped; that it is to the relief of stricture of the Eustachian canal what the improvement by the introduction of the catheter in its inflation was to the Politzer method of inflation.

In regard to the technique, several gentlemen have made use of, and try to justify their position in using, the rubber catheter for the purpose of insulation. I have tried it and have given it up, preferring the pure silver catheter, which can be so much more effectually sterilized by boiling, more easily bent to fit accurately in the mouth of the Eustachian tube, and easily insulated by the rubber tissue wound about it in the manner exhibited in the catheter which is being passed around.

In regard to the use of the bougie which has been insulated up to the bulb, I have never thought it necessary to use it.

The current strength which is indicated on the milliampère-meter always is the current strength which comes from the point of closest contact with the tissues, because that is the point of least resistance to the current. This, naturally, is at the point of the stricture where the bulbous head of the bougie comes in contact with it. Of course the current in lesser strength comes from every point of contact with the other portions of the tube, but as it is quite probable that the whole mucous lining of the Eustachian see how, if pus were present, it could have been absorbed. I am more inclined to think that an error in diagnosis was made. Patients with pus either in the antrum or under the periosteum will not get well unless it is evacuated.

In reply to Dr. Rupp I would make the same statement.

During an assistant-surgeonship of three years I saw only one case of mastoiditis operated upon. If you will now refer to the records of Mt. Sinai Hospital, where they were doing the mastoid operation, at this time, you will find that from eighty to a hundred cases were operated upon each year. The operation is now performed at the Eye and Ear Infirmary, and the records show a large number of cases operated upon each year. Patients are going to the dispensaries where the mastoid operation is being done. During the three years of which I speak, I do not think my chief operated upon a single case. Now we are operating upon from one to two hundred cases a year. I do not think that mastoiditis has increased. The figures simply mean that patients go to our hospital now because they are operated upon, and that formerly they went to other hospitals where the operation was done in these cases.

With reference to what Dr. Phillips has said, I agree with him in the main. Hot irrigation and the use of poultices, especially the latter, I do not approve of; nor do I consider them abortive measures.

With regard to the remark made by Dr. Meierhoff to the effect that cold applications are painful in some cases, I would say that when the pain is neuralgic cold will be painful; when it is inflammatory, cold applications will relieve pain.

Report of a case of acute otitis media, cerebellar abscess; operation; death from meningitis. By Dr. WENDELL C. PHILLIPS. (Published in full in this issue, p. 85.)

Discussion.—Dr. DENCH: We are all indebted to Dr. Phillips for the report of this interesting case. One or two points impressed me: first, the frequent irrigation of the abscess cavity. It has never seemed to me wise to irrigate cases of this kind after the cavity has been thoroughly cleared out. Dr. Phillips says that in this case the cavity was irrigated every two hours, night and day. Is there any advantage in irrigating so frequently? Personally, I have been afraid of irrigating too early for fear that the fluid may infect neighboring tissue and that the force of the stream may break down the limiting membrane and infect healthy cerebral substance. I also feel the same way about using gauze packing, and am of the opinion that the introduction of a tube is the best treatment for these cases. In the cases which I have lost gauze packing was used. Another method of treating these cases, which was suggested by Dr. Hartley, consists in lining the cavity, after all broken-down tissue has been removed, with rubber protective tissue, carrying the protective well back into the cavity, and filling it with a packing of sterile gauze. As the cavity contracts, the gauze is removed gradually and without lacerating the wall of the cavity.

The second point in regard to operating on these cases is the importance of introducing the finger into the bottom of the cavity in order to make sure that nothing remains. A great many surgeons do not carry out this procedure, which was suggested by Von Bergmann and carried out by him with the best results in his work in brain surgery. I have operated on five or six of these cases, only one of which was successful. By thus introducing the finger one can break down necrotic brain tissue with much less danger to the surrounding tissue than by the introduction of an instrument or by irrigation.

Dr. McKERNON: A year and a half ago I had two cases of cerebellar abscess under my care. In these cases the cavity was irrigated every forty-eight hours with a saline solution and packed with gauze. Both patients made a good recovery. I also had a case of abscess of the temporo-sphenoidal lobe, in which the same treatment was employed with success. I would like very much to try the method spoken of by Dr. Dench,—that is, lining the cavity with rubber tissue. So far I have had no bad results from irrigating in these cases. On the contrary, the circulation seemed to improve and the edges of the sloughing tissue cleared up and looked better.

Dr. PHILLIPS: In reply to Dr. Dench I would say that I did not introduce my finger into the cavity of the abscess in the case reported. The operation was performed without an anæsthetic, and I was obliged to be as gentle as possible.

In regard to the frequent irrigations, these were employed as a result of consultation with other surgeons. My idea was to keep the pressure altogether away from the brain. The tube employed was a perforated drainage-tube, and as the fluid was injected the pus welled out. Good drainage was my sole idea, and this is why I followed out this plan.

REPORT ON THE PROGRESS IN OTOLOGY FOR THE THIRD QUARTER OF 1900.

By Dr. A. HARTMANN.

Translated by Dr. Arnold Knapp.

GENERAL.

a.—REPORTS AND GENERAL COMMUNICATIONS.

193. **Bürkner.** Report of the policlinic for diseases of the ear and nose in Göttingen during 1898 and 1899. *Arch. f. Ohrenheilk.*, vol. xlix., p. 250.

194. **Stetter.** Experiences in the field of ear, nose, throat, and mouth diseases. *Monatsch. f. Ohrenheilk.*, Nos. 3 and 4, 1900.

195. **Bing.** Prophylaxis in otology. *Handbuch der Prophylaxe*, part viii., Munich, 1900.

196. **Gerber.** Rules of prevention in ear disease. S. Karger, Berlin, 1900.

197. **Gerber.** Origin and prevention of ear diseases. *Ibid.*

193. The results obtained with the use of various new medicinal agents are worthy of note. Formalin, twenty drops to the litre of water, was used in irrigating chronic suppurations of the middle ear. The results were as satisfactory as with cresol pur. liquef. Nosophen was employed in nose work, after cauterization, in hypersecretion and as a deodorant. Eudoxin, the bismuth salt of nosophen, has a similar action. Protargol and amyloform have been disappointing. Naftalin has been useful in eczema of the ear and nose. Bloch.

194. The report contains the observation of a case of epithelioma originating at the site of the wound for an ear-ring. A patient who practised passing the catheter and bougie succeeded in perforating the drum with the latter instrument. Killian.

195. A very complete description of the rules of prophylactic value in the affections of the various parts of the ear.

Hartmann.

196–7. The rules set forth by GERBER chiefly apply to the nose and mouth. Without the advice of a physician, a nasal or aural syringe should not be used; one side of the nose should be blown at one time only. The removal of the tonsil or the incision of the drum is without danger. If medical advice is not obtainable in pain in the ear, six leeches should be applied near the ear (!). In the second pamphlet these rules are more fully explained. HARTMANN.

b.—GENERAL SYMPTOMATOLOGY AND PATHOLOGY.

198. **Müller.** Objectively perceived entotic noises without annoyance. *Aerztl. Sachverständigen-Zeitung*, No. 10, 1900.

199. **Krotz.** Disturbances of sight and hearing, and paralysis of the ocular muscles after head injuries. *Wiener med. Presse*, No. 32, 1900.

200. **Eitelberg.** ′ What connection has agaraphobia to certain diseases of the ear? *Wiener med. Presse*, Nos. 27–29, 1900.

198. MÜLLER's patient experienced a rhythmic, clacking noise in the right ear. The noise was continuous and synchronous with the pulse. Pressure on the cervical vessels caused it to cease. The noise was not troublesome. A similar noise in the left ear disappeared after an otitis media. The site of the origin or seat of the lesion could not be determined. HARTMANN.

199. In eleven of KROTZ's cases disturbances in the eye and in the ear of the same side were present. The fractures involved the optic canal, the ethmoid bone, the supraorbital fissure, and the temporal bone. POLLAK.

200. EITELBERG shows that agaraphobia is not identical with and not dependent on the vertigo observed in diseases of the ear, and only occurs when the organism deteriorates. This took place in a case observed by Eitelberg after the excessive administration of thyroid tablets. POLLAK.

c.—METHODS OF EXAMINATION AND TREATMENT.

201. **Zarniko.** A clean forehead mirror. *Monatschr. f. Ohrenheilk.*, No. 4, 1900.

202. **Kayser.** A tampon forceps. *Monatschr. f. Ohrenheilk.*, No. 8, 1900.

203. **Cordes.** An apparatus to rarefy the air in the external canal with manometric measure of the negative pressure. *Monatschr. f. Ohrenheilk.*, No. 9, 1900.

201. A detachable and washable white forehead band which

is fastened behind. The reflector works on a Kirstein joint and can be taken hold of by means of a detachable and sterilizable double plate. KILLIAN.

202. KAYSER's forceps winds the cotton on the cotton carrier to form the tampon. KILLIAN.

203. The rarefaction of the air is effected by a suction pump which is worked by a toothed winder. The degree of negative pressure is recorded by the manometer. Scleroses, chronic catarrhs, and sequelæ are treated with benefit. Simultaneously the air is rarefied by the catheter. KILLIAN.

d.—DEAF-MUTISM.

204. **Bogdanow-Beresowski.** On the restoration of hearing in deaf-mutes. *Wratsch*, No. 20, 1900.

204. After a complete review of the literature, and especially of Bezold's and Urbantschitsch's excellent investigations, the author reports his results with hearing exercises in deaf-mutes, in all, eleven patients. The results are in general quite satisfactory. SACHER.

EXTERNAL EAR.

205. **Bentowin.** The dangers of perforating the lobule. *Eschenedelnik*, No. 37, 1900.

206. **Jurgens.** Parotitis in connection with diseases of the canal. *Monatsch. f. Ohrenhlk.*, No. 7, 1900.

207. **Church, B. F.** A tick in a man's ear for two years. *Laryngoscope*, July, 1900.

205. After perforating the lobule for an ear-ring, in a girl ten years old, herpes tonsurans circumscripta set in. SACHER.

206. The autopsy in a case of bilateral parotitis, observed by JURGENS, showed : suppuration of the left gland, with extension to the outer and middle ear, septico-pyæmia with multiple disease of the viscera. KILLIAN.

207. Two years ago severe pain of a clawing or scratching character was felt in the right ear. Masses of what seemed to be blood clots mixed with cerumen were frequently removed from the auditory canal. Later the pain became continuous, extending over the mastoid region.

After an accumulation of wax and epithelium was removed, close inspection revealed several moving bodies, like maggots, perforating a bulging drumhead. The mass was removed with forceps and found to be a large, live tick, which was embedded in a sulcus against the drum-membrane. The drum was eroded, but not perforated. J. B. CLEMENS.

MIDDLE EAR.

a.—ACUTE OTITIS MEDIA.

208. **Piffl.** Acute otitis media and its treatment. *Prager med. Wochenschr.*, Nos. 21–24, 1900.

209. **Kadzich.** Symptomatology of otitis media in influenza. *Medicinskoje Obosvenje*, April, 1900.

210. **Roosa, D. B. St. John.** The early treatment of acute aural disease. *The Post-Graduate*, June, 1900.

211. **Wilson, Norton L.** Acute otitis media. *The Medical Age*, July 10, 1900.

212. **Keiper, Geo. F.** Report of a case of double mastoiditis ; operation ; recovery. *Stylus* (St. Louis), July, 1900.

213. **McKernon, James F.** The abortive treatment of acute mastoiditis. *The New York Med. News*, August 25, 1900.

214. **White, Faulder.** Mastoid abscess in the absence of middle-ear disease. *Brit. Med. Journal*, Oct. 20, 1900.

208. This is an exhaustive paper, read before general practitioners. The treatment advocated is the one practised at the German Ear Clinic at Prague. According to Zaufal, this disease runs a cyclic course, with sudden onset, and decreases on the seventh or eighth day by crisis or lysis ; in general the course is more rapid and favorable if no perforation of the drum-membrane takes place. Treatment, therefore, should be directed to relieve the pain, and, if possible, prevent the spontaneous perforation of the drum and render the artificial perforation (paracentesis) unnecessary. If the perforation nevertheless does take place, a secondary infection from the auditory canal and the Eustachian tube is more likely to occur, making the acute process a chronic one and protracting the course of the disease. After perforation the possibility of cholesteatoma is also given.

Treatment consists in rest in bed, application of hot alum. acetat. solution, sod. salicylat. 0.5 *g*. every two hours, and painting of iodine about the ear. Paracentesis is then rarely necessary. In 1896, only 10 paracenteses had to be performed among 482 cases of acute otitis media. If the fever and pain have not diminished or have increased on the seventh or eighth day, paracentesis should be performed. In children, where an acute otitis media seems to be the only explanation for a severe general affection, or in the presence of a complication, paracentesis is indicated. After perforation, strict asepsis is necessary to guard against secondary infection. Profuse discharges are removed by irrigation ; in slight discharge powders may be used. The nose and naso-pharynx are to be treated if necessary. After the cessation of discharge and inflammatory symptoms, if hearing does not return of itself, the various methods for improving the hearing and massage after Zaufal are recommended. PIFFL.

209. Otitis following influenza is frequently associated with severe neuralgic pain in the region of the trigeminus. In a case of the author's, the neuralgic pain persisted for three weeks after paracentesis. Ear-pain continuing after paracentesis may be classified as follows: 1. Pain from collection of pus. 2. Pain, especially nocturnal, due to a lesion of the periosteal mucous membrane. 3. Pain due to mastoiditis. 4. Neuralgic pain. The last sets in periodically and in short attacks, and is localized in the branches of the auriculo-temporal nerve. It is not dependent on the aural lesion, but is a symptom of the influenza toxæmia. SACHER.

210. If a diagnosis of an acute middle-ear inflammation can be made within a few hours of its origin, the free use of hot water, of a temperature from 90° to 100° F., can generally be depended on to subdue it. The irrigations should be repeated every fifteen minutes or every half-hour until the pain ceases, and from one pint to one quart of water should be used at each douching. Should this fail to relieve the pain within a reasonable time, the application of leeches upon the tragus is advised. A Wilde's incision is considered a better evacuant for a red, tender, and swollen mastoid.

Should these antiphlogistic measures be unavailing, it will then be time enough to consider paracentesis. ROOSA strongly denounces *early* paracentesis and would only make use of it where there is excessive bulging of the membrana tympani. Where the inflammatory process has not gone on to suppuration, there is too much danger of infecting the cavity of the tympanum by it. He thinks that many a case has been converted into a serious one by an unnecessary paracentesis. A spontaneous rupture is to be preferred to too early an opening with the knife.

To keep the ear in an aseptic condition, douchings of hot, sterilized water are more relied upon than the use of medicinal antiseptics. Upon a subsidence of the acute symptoms, inflation by Politzer's method is practised. Due attention is bestowed upon the nose and throat where necessary.

Infants suffering with earache in the night can be relieved by breathing frequently in the ear. J. B. CLEMENS.

211. WILSON finds that the most satisfactory treatment in these cases is small doses of calomel, leeches in front of the tragus, and hot-water irrigations. The fountain syringe used for this purpose has a return-flow bulb attachment, permitting the water to flow out without removing the tip.

J. B. CLEMENS.

212. A case of double mastoiditis, due to an extension of otitis media suppurativa in both ears. The mastoid integument was swollen and painful, with considerable lapping of both auricles. The mastoid operation was first performed on the right side, in which much pus and carious bone were found and removed. The pathological condition of the left mastoid was quite the same as the right. A right facial paralysis, noticed shortly after the operation, was due to excessive packing.

The following day surgical erysipelas developed in both wounds. Under appropriate treatment the case made a satisfactory recovery.

J. B. CLEMENS.

213. This paper is a refutation of the doctrine that the only rational means of aborting acute mastoiditis is to apply moist and dry heat over the mastoid and around the ear. MCKERNON thoroughly studied and tested the effect of heat in aborting acute mastoiditis in a series of ten cases, four of which occurred in children under eight years of age, and six in adults. The results were unsatisfactory in each and every case, and he condemns its use for this purpose as ineffective. Heat appears to diminish or stop the pain, but at the expense of softening the tissues beneath, thereby aiding and advancing the inflammatory process. He advocates the use of cold by Leiter's ice coil, which must be applied snugly over the mastoid surface, and kept so. At the same time a purgative is given, and the ear is irrigated with bichloride solution 1:4000. In cases where there is insufficient drainage, a free paracentesis of the most bulging part of the drum and canal is made. Generally after twenty-four to thirty-six hours this method has produced flattering results in his hands.

J. B. CLEMENS.

214. A man aged seventy, in January, 1899, after sitting in a draught at church, felt intense pain in the right ear. The pain continued until August. The hearing was unaffected, and there was no discharge. WHITE did not see him until August 20th. There was then mastoid trouble, which necessitated operation. A disc of bone was removed with the trephine, and a cavity the size of a walnut was found, containing inoffensive pus. Recovery.

White thinks that the case was one of simple abscess of the mastoid, due to cold; a conclusion which, it seems, he was hardly justified in drawing from the data given.

ARTHUR H. CHEATLE.

b.—CHRONIC PURULENT OTITIS.

215. **Gomperz.** The treatment of adhesions in the middle ear. *Wien. medic. Wochensch.*, Nos. 33–35, 1900.

216. **Mendoza.** A new, rapid, and certain method of exposing the middle-ear cavities. *Arch. Internat. de Laryng.*, *d'otol.*, etc., vol. xiii., No. 3.

217. **Gläser.** Results on 57 mastoid operations in chronic purulent otitis. Dissertation, Breslau, 1900.

218. **Brieger.** On the operative treatment of chronic purulent otitis. *Breslauer Statistik*, xx., 1, 1900.

219. **Fagge, C. H.** On the treatment of chronic middle-ear suppuration by removal of the malleus and incus. *Guy's Hosp. Reports*, 1899.

220. **Wilson, Harry.** A case of mastoid disease, with necrosis and sequestrum of the petrous portion of the temporal bone. *Annals of Otology, Rhinology, and Laryngology*, May, 1900.

215. In adhesion of the drum and malleus to the labyrinthine wall GOMPERZ recommends the interposition of a strip of celluloid paper after division of the adhesion. POLLAK.

216. MENDOZA has devised a dental burr adapted to Stacke's stapes-protector; a special protector (protecteur trépan) guards against injury. SCHWENDT.

217. Of these 57 cases from Kümmel's practice, 22 were healed, 3 nearly healed, and 7 died. HARTMANN.

218. This is an exhaustive and interestingly written study. The indications, operative technic, and subsequent treatment are fully described. ZIMMERMANN.

219. This is a careful paper, giving a résumé of the subject and a record of 15 cases treated by removal of the malleus and incus. ARTHUR H. CHEATLE.

220. The patient had otorrhœa in the right ear, for three or four years, with occasional acute attacks of mastoid pain and tenderness. Prior to the operation the tissues over the mastoid and down the neck were swollen and tender, and there was a fluctuating swelling situated about two inches below the mastoid tip. There was marked right-sided facial paralysis. The usual mastoidectomy was performed and, upon reaching the site of the middle ear, it was found filled with a large, firm, movable body, its surface covered with granulations and bathed in pus. The body was removed and crushed with forceps in the process, and, after being cleaned, the fragments were found to make up practically the entire labyrinthine portion of the temporal bone. There was a normal and uninterrupted recovery.

J. B. CLEMENS.

c.—COMPLICATIONS OF CHRONIC PURULENT OTITIS.

221. **Richards, George L.** A brief report of a case of cerebral abscess of otitic origin; operation; death. *Boston Med. and Surg. Journ.*, Aug. 16, 1900.

222. **Richardson, W. G.** Operation for cerebral abscess; recovery. *Brit. Med. Journ.*, Oct. 20, 1900.

223. **Friedenwald, Harry.** Septic thrombosis of the lateral sinus. *Maryland Med. Journ.*, June, 1900.

224. **Moore, William O.** Acute otitis media supervening on otitis media purulenta chronica. Resulting in necrosis of temporal, occipital, and parietal bones, with closure of the lateral sinus and abscess of cerebellum. *The Post-Graduate*, June, 1900.

225. **Braun.** Demonstration of a brain and left temporal bone of a man, aged twenty-seven, who had been operated on for left-side otitic cerebellar abscess. *Münch. med. Wochenschr.*, No. 29, 1900.

226. **Hammerschlag.** A clinical contribution to the study of meningitis serosa. *Wien. medic. Wochenschr.*, No. 35, 1900.

227. **Scheibe.** Purulent meningitis caused by the bacterium lactis aërogenes (Escherich). *Prag. medic. Wochenschr.*, No. 15, 1900.

228. **Meier.** On air embolism in operations on the sinus. *Arch. f. Ohrenhlk.*, vol. xlix., p. 241.

229. **Lewy.** A contribution on otitic pyæmia. *Monatschr. f. Ohrenheilk.*, No. 9, 1900.

230. **Kokizki.** A case of purulent thrombo-phlebitis of the transverse sinus. *Bolnitschkaja Gaseta Botkina.*, No. 33, 1900.

231. **V. Stein.** A safe method of trephining with a new basket-shaped protector and a new burr. *Centralbe. f. Chirurg.*, No. 19, 1900.

221. The patient, a male twenty-eight years old, had an attack

of acute otitis media in '97, followed by discharge. He was not conscious of any trouble since that time until September, '99 (a period of two years), when, after a hair-cut, he was attacked by pain in the head, loss of appetite, and general weakness. Pain in the right ear was severe with slight discharge. A small perforation was found in the drum. Poultices and douching with hot boric acid solution constituted the local treatment.

In several weeks he recovered sufficiently to leave the hospital and go home. On the way he became dazed and wandered into a swamp, where he was found late that evening. Later he became partly paralyzed on the left side and unconscious. A mastoidectomy was at once performed but no pus was found in the cells ; the lateral sinus was uncovered and found healthy. A trephine opening was then made one inch above and behind the bony auditory canal and, at a depth of a quarter of an inch in the substance of the brain, an abscess was evacuated of about two ounces of foul-smelling pus. A broncho-pneumonia shortly developed from which he died. J. B. CLEMENS.

222. At the Northumberland and Durham Medical Society held on October 11, 1900, RICHARDSON showed a case of recovery from cerebellar abscess. The patient was a child aged seven years. It is hoped that full notes will appear in the ARCHIVES. ARTHUR H. CHEATLE.

223. The case reported was that of a man twenty-nine years of age, who had an attack of acute otitis media in the left ear. Early paracentesis failed to relieve the severity of the inflammation. There was later severe and constant pain in the head and neck, with marked mastoid tenderness. The membrana tympani showed redness at this time, but no bulging. Temperature fluctuating. At the operation the mastoid was found to be exceedingly vascular and softened, with much carious bone in the posterior portion of the tip. The operation eased the pain, but the temperature showed a septic rise and fall. At no time was there a suspicion of a chill. About one week after the mastoid operation a sudden rise in temperature to 105.2° F., seemed to point to disease of the sinus. The latter was uncovered at a second operation for two and a half inches, and found to contain a large, solid, dark thrombus in the upper part, while from the lower end escaped much pus. A satisfactory return flow was established from both ends, and the jugular was not ligated. Pus

cultures showed presence of streptococci. The case made a good recovery.

The absence of leucocytosis, and, still more, the absence of chills, make the case of interest. J. B. CLEMENS.

224. The patient had a suppurating ear for three years. In March of the present year, after surf-bathing, severe acute symptoms developed which ultimately led to an acute mastoiditis. A mastoidectomy was refused at this time, so a Wilde's incision was made through the red and swollen mastoid integument, from which no pus escaped. Later the pain and swelling over the mastoid returned, and the cells were opened, followed by an escape of pus. Severe headache, nausea, vomiting, and dizziness occurred later with a septic temperature. Death followed about one month after the mastoidectomy.

Autopsy four hours after death: Extensive caries extending from the mastoid as far as the parieto-occipital and upward to the temporo-parietal suture; an opening was found through this suture leading into the cranial cavity at a level of the lateral sinus. The sinus was like a fibrous cord. The meninges were much congested, especially at the posterior regions. Dura adherent at the posterior third of longitudinal sinus. Pus found in the posterior fossa between the dura and the skull. In the centre of the right lobe of the cerebellum was an abscess the size of a walnut. No pus in the mastoid cells and only a few drops in the tympanum. J. B. CLEMENS.

225. The temporal lobe was first incised; then the abscess in the cerebellum was found and evacuated. Death after thirty hours. No meningitis, no secondary abscess. Necrosis of bone in posterior surface of the petrous pyramid. SCHEIBE.

226. HAMMERSCHLAG successfully operated on two cases where, following a chronic purulent otitis, severe meningeal symptoms supervened. In both cases the operation revealed a circumscribed external pachymeningitis with caries of the temporal bone. A marked increase in intracranial pressure due to an exudation of a serous fluid into the ventricles is stated as the cause for the severe meningeal symptoms. In the first case lumbar puncture was performed. In the second, the middle and posterior cranial fossæ were exposed, the sinus opened, dura incised, and cerebellum explored. Recovery took place in both.

POLLAK.

227. Autopsy on a female infant eight days old showed the meninges over the brain were distended with a cloudy serous fluid, in places with thick, purulent, yellowish-green exudate; both middle ears contained considerable pus; the nasal mucous membrane was unaffected. The same bacilli were found in the fluid of the meninges, in the pus of the middle ear, and in the nose. SCHEIBE after numerous culture experiments places them in the group of the bacterium lactis aërogenes.

HARTMANN.

228. MEIER reports a case of true air embolism in the transverse sinus with recovery. A patient, twenty-seven years old, was operated on for acute mastoiditis and sinus phlebitis. The wall of the sinus was accidentally injured by a chip of bone. As this was removed subsequently during the dressing of the wound, a hissing sound in the wound was heard simultaneously by the doctor and patient. The patient collapsed, gasped, became pulseless and blue. Gurgling sounds were heard over the heart. The patient recovered completely after fifteen minutes. To prevent similar accidents the author recommends the insertion of a small plug centrally between the bone and sinus wall, then after stroking the blood back, placing another plug peripherally, a procedure which has been suggested before. BLOCH.

229. The patient was a child of five. The sinus appeared normal. The jugular and facial veins were ligated; the high fever, however, continued for five days. Recovery followed.

KILLIAN.

230. A man, aged thirty-seven, suffered pain in the left ear two months ago, after a severe cold. A month later the pain increased in severity and became localized behind the ear. Paracentesis was followed by no discharge and no improvement. On admission the following symptoms were present: Zaufal's dilatation of the cutaneous veins, Bonnel's distinctly circumscribed tenderness about the mastoid emissary, Griesinger's doughy swelling without inflammatory signs, monolateral headache, vertigo, and apathy. The mastoid process was not swollen, the tip only was painful. Optic neuritis. Temperature never over 37.7°, no chills. At the operation, on retracting the periosteum back from the mastoid incision, the bone over the lower knee of the sinus was found softened. In place of the sinus there was an abscess cavity containing half an ounce of pus. The dura was healthy. Copious venous hemorrhage occurred, but was easily checked. Recovery

uneventful. The pus showed presence of staphylococcus pyogenes albus. SACHER.

231. A movable basket-shaped protector fits to the shaft of the drill and prevents its penetrating too deeply. When the skull is opened, a drill is used with a rounded centre and obliquely radiating cutting edges. ZIMMERMANN.

d.—OTHER AFFECTIONS.

232. **Reinhard.** On the etiology of cicatricial strictures at the pharyngeal opening of the tube. *Monatschr. f. Ohrenhlk.*, No. 6, 1900.

233. **Suzár.** Carcinoma of the middle ear, with paralysis of the facial, glosso-pharyngeal, spinal accessory, vagus, and hypoglossal nerves. *Proosi hetilap*, No. 39, 1900.

234. **Fleming, E. W.** Report of a case of fibroma involving the tympanic cavity. *Laryngoscope*, July, 1900.

232. REINHARD has collected several cases from literature and twelve from Schrötter's clinic, where scleroma had caused changes in the tubal ostium. He found that scleroma produces a progressive cicatricial contraction of the pharyngeal opening of the Eustachian tube, with chronic inflammatory changes in the deeper tissues leading to stenosis and displacement of the cartilaginous part with consecutive changes in the ear. Several instructive cases are described in a table. KILLIAN.

233. SUZÁR describes a case of epithelial carcinoma extending to the Fallopian canal and to the surrounding parts of the base of the skull and neck, which compelled and directly involved some of the above-named nerves. Microscopic examination gave carcinoma epitheliale keratodes. POLLAK.

234. The patient, a male aged forty, noticed a fulness in his left ear, which became more intense each day. An examination revealed a fairly solid tumor-like mass growing from the depths of the auditory canal and almost filling the concha. The growth was very rapid, attaining its size in about twelve days; it was slightly movable and highly sensitive to the probe. On account of its size the point of origin could not be detected. A section of the tumor was removed for microscopical examination and it was pronounced to be a true fibroma.

By detaching the auricle from behind and exposing the osseous canal, the tumor was easily excised with a wire ecraseur. It was found growing from the tympanic cavity and posterior osseous canal. Granulation tissue subsequently developed, which was removed by curette, but the fibroma showed no disposition to recur. J. B. CLEMENS.

NERVOUS APPARATUS.

235. **Moller.** A case of labyrinthine angioneurosis, accompanied with the onset of Ménière's symptoms. *Arch. f. Ohrenhlk.*, vol. xlix., p. 247.

236. **Sternberg.** The so-called tumors of the acoustic nerve. *Zeitschr. f. Heilk.*, vol. xxi., No. 4.

235. A man, aged forty-two, syphilitic, nervous, hypochondriac, suffered after long-continued moderate deafness in the course of several days from a number of short attacks of vertigo with subjective noises, and once with vomiting. After pilocarpine the subjective symptoms improved, especially hearing for whisper. The results of hearing tests make a stapes anchylosis probable. The rapid repetition and change in subjective symptoms favor the diagnosis of angioneurosis. BLOCH.

236. STERNBERG describes five cases of tumors, which were either directly connected with the auditory nerve or had grown into the porus acustic. int. Histologically they proved to be gliofibroma (three cases), sarcoma, or fibroma, and one derived from the dura. Seven additional cases were collected out of the literature, of which three were considered gliomatous, the others principally sarcomata. The generally accepted origin of these tumors from the acoustic nerve does not seem probable to the author, especially as in the case of the mixed tumors of gliomatous nature, the origin appears to take place from embryonal remnants occurring in the region of the dorsal cranial nerves. PIFFL.

(To be continued.)

BOOK REVIEWS.

I. **Rhinology, Laryngology, and Otology, and Their Significance in General Medicine.** By Dr. E. P. FRIEDRICH, of Leipzig. Authorized translation from the German; edited by H. HOLBROOK CURTIS, M.D. Price, $2.50. W. B. Saunders & Co., Philadelphia, 1900.

The book treats of the manner in which the nose, throat, or ear is affected in the course of a general disease. The practitioner in whose mind the general disease is foremost can learn of the local manifestations occurring in these special organs, and will often receive aid to diagnosis from them. The book is of still greater importance to the special worker, for it shows the closely existing connection of many local lesions to affections of the general body, and the interdependence of one organ upon another. It is just this knowledge which prevents the specialist from following out his work along too narrow lines.

The affections of the nose, throat, and ear are described as they occur in the diseases of the respiratory organs, the circulatory system, digestive system, blood, chronic constitutional diseases, infectious diseases, kidney, skin, sexual organs, eye, intoxications, and nervous system, with an appendix on the reflex neuroses.

The information collected in this book is exhaustive and unusually complete; it shows the work of a writer who combines a large clinical experience with a thorough knowledge of the bibliography. It is an excellent and instructive study to all special workers, and furnishes a necessary addition to the standard text-books. The task of the translator is to be commended. The book is well gotten up; the unnecessary though prevalent practice of adding many pages of advertisements is adhered to.

A. K.

II. **The Year-Book of the Nose, Throat, and Ear.** Edited by Dr. G. P. HEAD and Dr. A. H. ANDREWS. Pp. 416. Price, $2. The Year Book Publishers, 100 State St., Chicago, 1901.

The Year-Book gives a very complete list of the articles dealing with the nose, throat, or ear which have appeared during the past year. Many of these are abstracted, and a reliable picture of the year's progress in these specialties has been furnished. The book is of value not only as a guide to the literature, but as giving the present opinion on many important subjects connected with the nose, throat, and ear. A. K.

MISCELLANEOUS NOTES.

The annual meeting of the American Laryngological, Rhinological, and Otological Society will be held at the N. Y. Academy of Medicine, in New York, May 23, 24, and 25, 1901.

A well-equipped Ear Department has been established in the former building of the Eye Clinic at Jena. There are accommodations for forty patients.

The Seventh International Otological Congress will be held in August or September, 1902, in Bordeaux.

The German Otological Society will meet this year in Breslau, on May 24th and 25th.

Professor Urbantschitsch, of Vienna, has taken the place of the late Professor Gruber on the editorial staff of the *Monatschrift für Ohrenheilkunde.*

EDITORIAL NOTICE.

The ARCHIVES OF OTOLOGY is a bi-monthly journal, published in annual volumes of about five hundred pages each, extensively illustrated with cuts in the text, half-tone text plates, and lithographic plates, many in colors.

About three quarters of the space is devoted to original papers, and the remaining quarter to a systematic report on the progress of otology, and to reports of societies, book reviews, and miscellaneous notes.

The papers and reports are original, and only accepted with the understanding that they are to be published in this journal exclusively. The original papers in the English edition appear in the German (*Archiv für Ohrenheilkunde*) either in full or in more or less abridged translations, and *vice versa.*

Any subscriber that wishes to refer to the original text of a translated or abridged paper may, by applying to the editor, obtain a reprint which, it is expected, he will return after perusal.

Original papers of value from any source are solicited.

Communications for the English edition of the ARCHIVES OF OTOLOGY should be addressed to DR. H. KNAPP, 26 West 40th Street, New York, or to DR. U. PRITCHARD, 26 Wimpole Street, W., London, England.

The subscription price of the ARCHIVES OF OTOLOGY is $4.00 per year, payable in advance. The price per number is 75 cents.

The ARCHIVES is sent postage free in the United States, Canada, and Mexico.

CONTENTS OF VOLUME XXX., NUMBER 3.

PAGE

1. A Case of Cerebellar Abscess. Operation. Recovery. By **W. G. Richards,** M.B., F.R.C.S. (With a temperature chart) . 179

2. Functional Significance of the Round Window. By Dr. **A. Frutiger,** of Basel. Translated and Abridged by Dr. J. A. SPALDING, Portland, Me. 181

3. Carcinoma of the Ear. By Dr. **Leopold Treitel,** M.D., Berlin. Translated by ADOLPH O. PFINGST, M.D., Louisville, Ky. . 189

4. Adenoid Operation on the Pendent Head under General Anæsthesia. By Dr. **P. Rudloff,** Wiesbaden. Translated and Abridged by Dr. C. MUND, New York 199

5. Tympanic Vertigo Due to Obstruction within the Eustachian Tube. By Dr. **Wm. P. Brandegee,** New York 205

6. A Correlation of One Hundred Successive Mastoid Operations. By **Edwin W. Pyle,** M.D., Jersey City 214

7. Empyema of the Right Maxillary, Ethmoidal, and Sphenoidal Sinuses with Sudden Blindness of the Left Eye. Operation. Recovery of Sight. By **T. H. Halsted,** M.D., Syracuse, N. Y. 222

8. A Case of Tuberculosis of the Ear, with Autopsy. By **Henry L. Swain,** M.D., New Haven, Conn. 230

9. Report of the Meeting of the New York Otological Society of March 26, 1901. By Dr. **H. A. Alderton,** Secretary . . 235

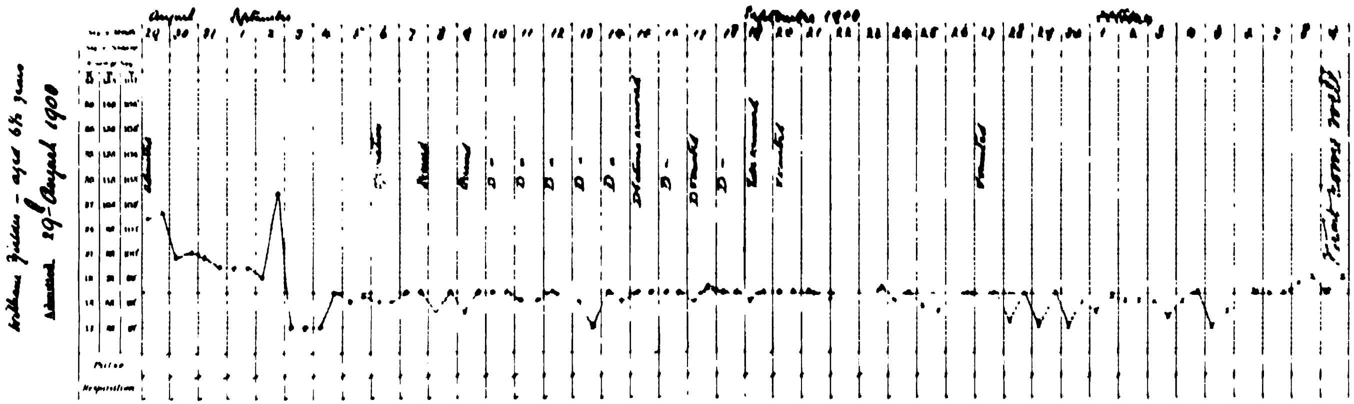
10. Report on the Transactions of the Section on Otology, at the New York Academy of Medicine, Meetings of March 13 and April 10, 1901 243

11. Report on the Transactions of the Otological Society of the United Kingdom. By Mr. **A. H. Cheatle** 262

12. Report on the Progress in Otology during the Third Quarter of 1900. By Dr. **Arthur Hartmann.** Translated by Dr. ARNOLD KNAPP 264

13. Book Notice 277
    Lehrbuch der Ohrenheilkunde für Aerzte u. Studirende. By A. Politzer. Fourth Edition.

14. Appointments — Körner, Urbantschitsch, Kümmel . . . 282



ILLUSTRATING W. G. RICHARDS'S PAPER, "A CASE OF CEREBELLAR ABSCESS."

VOL. XXX. No. 3.

ARCHIVES OF OTOLOGY.

A CASE OF CEREBELLAR ABSCESS. OPERATION. RECOVERY.

By W. G. RICHARDS, M.B., F.R.C.S.

(With a temperature chart.)

Wm. Afielder, aged six and a half years, was admitted to the Newcastle-on-Tyne Royal Infirmary on August 29, 1900. He had a discharge from his left ear since he was four months old, and measles eleven months ago.

His present illness began somewhat acutely, seven days before admission, with pain in the left ear and cessation of the discharge. During that week his temperature varied between 100° and 102° F.

On admission he was in poor condition and looked ill. The tongue was coated and dry, the lips were fissured, and the teeth were covered with sordes. He was drowsy and could not sit up in bed. He lay curled up on his right side with his head held somewhat firmly rotated and bent over to the left side. There was no discharge from the ear, but there was slight tenderness over the mastoid process. There was no tenderness or swelling over the deep veins of the neck. The ear was syringed frequently with hot boric lotion, and hot fomentations were kept continuously applied.

The temperature and pain decreased steadily during the next few days. The mouth and tongue improved and he seemed to be getting well. In the morning of September 2d a macerated earwig was washed out of the meatus and the discharges became more abundant. In the evening he was not so well and his temperature rose to 102.4° F. In the morning of September 3d the temperature fell to 97° F. and it never rose again above 98.4° F.

Although there was an absence of feverish symptoms and local pain or swelling, yet he remained fretful and rather drowsy. He got gradually thinner and when raised up in bed he held his back very rigid. He lay in bed on either side with knees drawn up, but he kept his eyes wide open, the upper lids not falling as low as the upper edge of the cornea, giving a strange, staring expression to the eyes. The pupils were normal, but there was slight photophobia.

On September 6th he did not seem so well. There was a total absence of local pain or tenderness, but he seemed to be gradually failing. He could not grasp an object, such as a penny, readily, but came to it with each hand by a wavy course. He found some difficulty in touching the tip of his nose with the index finger of either hand. During the morning the pulse began to intermit one beat in five.

I therefore decided to operate. A vertical incision was made from the tip of the mastoid process upwards and then curving backwards. The periosteum was raised over a wide area and the bone was found to be normal. The antrum was then opened with a gouge in the suprameatal triangle ; no pus was found, but there was a little granulation tissue and a small sinus leading backwards and downwards. A trephine was then applied behind the hole already made, and the lateral sinus was exposed. It appeared to be normal, so a farther extension of the opening was made backwards. The needle of an exploring syringe was then thrust through the dura mater, about an inch and a half into the cerebellum, and two drachms of "laudable" pus were withdrawn. A second syringeful (ʒ ij) was withdrawn and then the dura mater was incised where the needle had penetrated, and an opening was thus made large enough to admit an India-rubber drainage tube a quarter of an inch in diameter. When the drainage tube was inserted for about an inch and a half there was a further discharge of two or three drachms of pus. The tube was made to emerge from a hole made for it in the skin flap, and then the flap was sewn in position with silkworm gut. The mastoid antrum was packed with iodoform gauze. The wound was dressed next day and the gauze in the antrum withdrawn. After the third day the wound was dressed daily and the tube was removed, cleaned, and replaced each time. On September 19th the tube was removed altogether. The temperature remained normal from the time of the operation ; the wound healed well ; he took his food and he slept well, and the nerve symptoms disappeared gradually. He regained his weight and went home well on October 9th.

FUNCTIONAL SIGNIFICANCE OF THE ROUND WINDOW.

By Dr. A. FRUTIGER, of Basel.

Translated and Abridged by Dr. J. A. Spalding, Portland, Me.

OPINIONS concerning the manner in which sound is conducted to the labyrinth always have been and still are divided. For this reason, says Bezold : " It is easy to see why both physiologists and otologists should repeatedly return to the investigation of a mechanism, the function of which can only be compared for interest with the refraction of the eye and the accommodation of the lens. Participation in this study by otologists seems additionally justified, since to them alone is given the opportunity to observe in the living those finer alterations in form and function both in the normal and diseased ear, the sum total of which first gives to the physiologist the material by the help of which each separate portion becomes comprehensible in its significance toward the function of the entire apparatus."

To begin with, there is no unity of opinion about the physiological function of the round window.[1] For whilst some assert that waves of sound impinging on the *Mt* pass via the ossicles and the O.W. to the labyrinth and that the R.W. serves as a sort of safety-valve to the labyrinthine fluids, others believe that the R.W. must be held responsible for the conduction of sound, and, finally, a third party regards both paths as possible.

The first attempts to gain insight into the NORMAL functions of the R. W. were made from the standpoint of the *anatomical relations*. Then, thanks to acoustic advances in the past century, *experiments* were made concerning the physiological significance of the separate portions of the sound-conducting apparatus. Now, together with experimental acoustics, the *pathological and anatomical* and particularly the *post-mortem conditions* in ears with normal hearing during life are of the greatest importance in the topic with which we are concerned. Finally, a further contribution to our knowledge of these functions has lately been afforded by Siebenmann's *experiments* of weighting the R.W. membrane with tampons and testing the hearing both before and after the use of such weights as moistened cotton or powdered boric acid.

---

[1] R.W. and O.W. will be used for abbreviation instead of constant repetition of the longer words, Round Window and Oval Window.—*Trans.*

The general trend of opinion, based particularly on experimental investigations, is against exclusive sound conduction through the R.W. At the same time all authorities agree that the elasticity and mobility of the R.W. membrane are very important. So, too, there is but one opinion about the mechanism of the R.W. membrane. Furthermore, it is agreed that this membrane serves as a safety-valve for concussions of the labyrinthine fluid. But, in opposition to others who give to this membrane only this rôle, Mueller, Rinne, and Weber-Liel claim that it conducts sound independently, though in a slight degree in comparison with the conduction by the ossicles.

These divergences of opinion may be explained by the fact that the interpretation of any experimental result is difficult and depends largely on the experimenter's personal opinion. And, after all, these experiments, laborious and deserving though they may be, are only an approximation toward the consideration of normal processes. There are always coarse imitations of natural conditions, of tones too intense, of dead parts, of openings into the labyrinth or tube, of the influences of unnatural conditions of resonance, etc.

Based now on the above-mentioned foundations, our opinion is *that, normally, conduction through the R. W. does not come much into account, but that this window is a pro-*

tective apparatus for the ear, a yielding wall for the vibrations of the labyrinthine fluids.

Pathologically, however, the conditions are quite different, as we shall soon see, and in discussing the function of the R.W. from this point of view we divide our material into three sorts. First, those cases of isolated disease of the stapes (resp. O.W.) especially in relation to the hearing whilst the patient was alive. For if with total obliteration of the chain of ossicles some hearing remains and simultaneously the R.W. membrane seems intact, the probability of conduction via the R.W. is great. Next we must discover whether isolated R.W. disease gives us any clue to its function, and finally whether affections of both windows give any idea of the value of the R.W. alone.

Examination of autopsy-reports in deaf persons in whom some disease of the windows seemed to be the cause of the deafness, shows that total obliteration of both windows is accompanied with total deafness. To cite cases which prove this would carry us too far. A bibliography can be found in Panse's paper.[1] How many, however, of these cases may have been due to *nervous alterations* must be a subject for further research.

Isolated disease of the R.W. has not often enough been observed to enable us to draw safe conclusions. Panse refers to ten, which on examination shrink to seven. He thinks that, considering the numerous variations found at the R.W. by Weber-Liel, we can hardly consider the alterations cited as pathological or as responsible for the clinical symptoms.

Let me here cite a case from v. Troeltsch. After a heavy cold, deafness ensued and increased steadily for seven years. Low voice close to the ear, and watch on contact. Autopsy: right ear *Mt* bluish gray, mucosa hypertrophic, ossicles movable, bands of adhesion to promontory. Entrance to R.W. obstructed with rigid connective tissue and abundant capillary meshwork. R.W. membrane thickened. Left ear: hammer and anvil separable only by force. Stapes not quite so rigid. R.W. membrane $\frac{1}{2}$ *mm* thick, with abundant vessels. Cochlea, with pigment.

---

[1] Deafness from rigidity of the tympanic windows, Jena, 1897.

If we cannot utilize isolated affections of the R.W. in judging of its function, observations of stapes anchylosis must always be of the greatest interest. For it has been shown that in post-mortem anchylosis of the ossicles, but intact R.W. membrane, the hearing may be greatly reduced, whilst perception for words spoken loud and close to the ear remains. Politzer explains this by assuming that with immobility of the ossicles sound can reach the labyrinth by bone-conduction, and that the motion so given to the labyrinthine fluid can extend toward the R.W. This view seems favored by cases of extreme deafness, in which words through a trumpet cannot be heard, whilst the same words spoken loud and close to the ear can be perceived without artificial aid. Bing is of the same opinion. For if the R.W. is an antagonistic opening to the O.W., as seems probable from the form of the R.W. membrane and its more extensive excursions toward the tympanum than in the opposite direction, as shown experimentally, it is, obversely, no less true that the O.W. is the antagonistic opening of the R.W. Therefore, if the O.W. is occluded, sound cannot be transmitted through the R.W. to the labyrinth, as is claimed by our opponents.

These opponents, Voltolini, Lucae, Moos, and others, seek to base their view on cases of bilateral anchylosis of the stapes with total deafness in one ear, yet slight in the other. That is to say, the autopsy shows on the side of the deaf ear some alterations in the R.W. or its membrane, whilst on the other side these seem intact.

Lucae thinks that a movement of the labyrinthine fluid towards the R.W. is not necessary, as Politzer assumed for the direct extension of musical tones through the bones of the head, and proved it in a case of malformation with no windows at all, yet a bell could be heard by bone conduction. Voltolini saw a woman, æt. forty-nine, totally deaf in the right ear, but hearing a loud voice and watch at one inch in the left. Bilateral stapes-anchylosis. On the right side a jelly-like plug in the R.W. niche and on the left an intact R.W. membrane, but the niche filled with connective tissue. The R.W. must have functioned, in Voltolini's opinion, because no person with good hearing, with meatus occluded, can hear a watch an inch away, as it ought to be heard, if there is such a thing as hearing through the bones of the head.

Politzer's claim for bone-conduction in synostosis of the stapedio-vestibular articulation, in which the patient hears a loud voice, is negatived by an experiment of Weber-Liel, in which during the transmission of sound to a glass tube glued to the temporal bone of a specimen no excursions whatsoever of the R.W. membrane could be seen. He thinks mobility of the R.W. membrane is sufficient to perceive a loud voice and attempts to prove it experimentally in this way. After having been dried, the O.W. niche and the incudo-stapedial articulation are immobilized with wax. Organ-pipe sounds outside the meatus with the tympanum occluded failed to move the membrane, whilst it did move, though less than normal, when speaking or singing voice entered the meatus. The movements were less in living people than in specimens because in the latter the aquæductus cochleæ is opened. These observations favor the idea that, pathologically, when hearing through the chain of bones is excluded but where nevertheless some hearing remains, *the R.W. may act vicariously in conducting sound to the labyrinth.* The aquæducts, which normally serve as safety-valves, may pathologically serve in a similar manner for minimal vibrations of the labyrinthine fluids. But, normally, the aquæducts cannot make the R.W. wholly indispensable, because the movements of the labyrinthine fluids towards that window can, owing to the minute space at hand, only be slow and gradual.

Siebenmann believes that the R.W. membrane may be utilized, normally, for some degree of hearing. Filling the R.W. niche with fluid or sinking it below the level of a tympanic exudate reduces the hearing but little. In tubal catarrh the hearing can be increased by Politzeration to 10 *m* or more for a low voice, even when the exudate rises half way to the top of the promontory.

If we now turn to *experimental tamponade* of the R.W. niche, and the tests of hearing before and after, we can only say that they confirm our opinion of the R.W. functions.

We must, however, distinguish between experimental tamponade with reference to the perception of high tones (Burckhardt-Merian and others) and those (Siebenmann) with reference to the lower tone limit.

Burckhardt-Merian found that where the perception was diminished or where the highest tones were not perceived at all, there was invariably an increased pressure on the R.W. membrane, just as in accumulation of fluid-exudate in the tympanum, and he proved it experimentally by tamponing the R.W. niche with cotton dipped in glycerine. Siebenmann, on the contrary, found the R.W. of no account in aërial conduction of the highest tones. The upper tone limit in one patient was not changed by tamponade. The elevation of the upper tone limit as well as the increased perception for tones of the upper terminal portion of the scale during Valsalva cannot, in his opinion, be referred to increased tension of the R.W. membrane.

This view is strengthened by experiments during tubal catarrh, the upper tone limit being often lowered by Politzeration, although the R.W. membrane, previously relaxed by the intratympanic aspiration, was by the air-douche brought nearer to its original tension, that is to say, made once more tense.

Panse found a case in which the hearing for whispered voice was reduced from 2½ *m* to 30 *cm* after tamponade of the R.W. niche. He recommends tamponade of the middle-ear space when exposed to view in patients, because such experiments are fully as useful as in animals or on specimens.

Another important thing for us to study is the hitherto unknown phenomenon that the perception for low tones can be increased by experimental tamponade, and here I will refer very briefly to three cases of Siebenmann's.

In the first one, tamponade was followed by great improvement for whispers and *by lowering of the lowest tone limit two octaves.* The patient had suffered from scarlatinal otorrhœa and deafness for many years. The discharge had lately returned with pain and granulations. Right ear, loss of hammer handle, *Mt* adherent to promontory and granulations at stapes. Whisper, 3 *cm.* Left ear, granulations in meatus, *Mt* absent, R.W. niche invisible. Fork a, heard longer by B.C. in the worse ear. Whisper, 2 *cm.* A month later, whisper right ear, 3 *cm*, left 2 *cm*, but insufflation of boric acid improved whisper right to 10 *cm*, left to 5 *cm.* Ten days later, after boric acid tampon had been again applied to right R.W. niche, whisper 100 *cm*, and the *lower tone limit fell two octaves lower from* e flat to E. This increase occurred after every subsequent experiment, but mechanical irritation soon ensued and the experiment was suspended so that we were unable to discover farther, whether B.C. was simultaneously improved with A.C.

This first case suggested to us that the phenomenon depended on pathological alterations in the *Mt* secundaria, but the next case proved that it occurred regularly.

For, in a woman with the residua of scarlatinal otitis, with occlusion of the right O.W., but with the R.W. free and probably a similar condition in the other ear, although the R.W. was not visible, powdered boric acid in the left ear raised the hearing from 15 *cm* to 50, whilst the lower tone limit fell almost an entire octave, from A to B_1.

A third similar case showed more than an octave extension downward of the lower tone limit. In this case there were extensive alterations at the O.W.

Siebenmann refers the increased hearing to insufflation of the powder upon the mucosa and R.W. region and not to pressure on the stapes as has before been assumed. The same may apply to that improvement of hearing so often observed when secretion reaccumulates in cases of residua with perforation.

The favorable influence of tampons on the perception of low tones seems to depend on the fact that weighted membranes vibrate better for lower tones, because the weight makes them vibrate slower. All thin membranes vibrate to all tones, but best to the tone which coincides most nearly in vibrations with their fundamental tone. Unweighted, the tense R.W. membrane is too thin and delicate to vibrate forcibly when low tones impinge upon it directly, and not via the *Mt.* A still better explanation may lie in the tampon at the R.W., obstructing sounds entering the cochlea through the O.W., and thus giving rise to *reverberation and reinforcement.* Such a view would suit the lower tones, for the reflexion and reverberation of higher tones would produce interference and diminished perception.

We cannot yet decide upon the *therapeutic value* of Siebenmann's discovery, but it will induce us to weight the R.W. membrane for *bass deafness with stapes anchylosis.* Permanent success in our first patient was interrupted by irritative symptoms, but the mucous swelling which even that produced led to marked improvement of hearing without the tampon, which lasted several days whilst the patient was under observation.

Delstanche's successful vaseline treatment of aural sclerosis (these ARCHIVES, xxv., p. 83) seems inexplicable, unless on the basis that the vaseline fills the R.W. niche and weights the membrane there.

We may sum up this paper as follows:

1. Whenever the O.W. is greatly altered pathologically, and the lower tone limit much reduced, hearing for bass tones can be improved by using tampons to the R.W. membrane. This membrane, therefore, seems also to conduct sound from the tympanum to the labyrinth; under NORMAL *conditions, however, only such higher tones, perhaps from the small octave (inclusive) upward.*

2. The R.W. membrane serves, normally, but chiefly in conjunction with the two aquæducts, to regulate the variations in tension of the labyrinthine fluids, namely:

a. In case of wave movements produced in the labyrinthine fluids by tones passing through the chain of ossicles.

b. In sudden shocks produced against the chain of bones by direct or indirect force.

CARCINOMA OF THE EAR.

BY DR. LEOPOLD TREITEL, M.D., BERLIN.

Translated by ADOLPH O. PFINGST, M.D., Louisville, Ky.

THE infrequency of carcinoma of the ear has always been recognized and is again evidenced by a recent report of Bezold, who in 20,000 ear cases observed carcinoma but four times. In recent years a somewhat greater proportion of such cases has been recorded. While the disease may possibly have been more common than formerly, it is more probable that the percentage was raised by the recognition of cases with the microscope whose cancerous condition was formerly overlooked when the microscope was not so universally employed. Judging from the observation of others, it would seem advisable in all cases of chronic otorrhœa occurring in middle life, which show a tendency to recurrent formation of granulation tissue, to make a microscopic examination of the pathological structure. Cases are on record which were not recognized as carcinoma until after operation upon the mastoid, presumably for ordinary caries; their malignant character became apparent by the rapid disintegration of the edges of the wound.

In consideration of the infrequency of carcinoma of the ear, I feel justified in presenting three cases which have come under my observation in the last two years:

CASE 1.—Male, fifty-five years old, was seen by me in April of 1896. He had double chronic otorrhœa since childhood, which had become more profuse and watery in the last few months, particularly on the left side. The chorion of both ears was thickened, livid, and scaly, resembling a frost-bitten part. The ear canal was narrowed by thickening of the soft parts. After removal of pus from the left canal, the tympanic cavity was seen to be filled with granulation tissue. This rapidly returned after cauterization and remained unaffected by treatment with absolute alcohol. My suspicion of its malignant nature was first aroused when, after a longer absence from the clinic than usual, the patient returned with the auditory canal half filled with granulation tissue. Its malignancy was subsequently established with the aid of the microscope. At about this time the clinical aspect of the case changed, marked pains developed over the mastoid region, although there was an absence of swelling over the bone itself. The swelling was confined to an area between the mastoid process and the lower jaw, which was also spontaneously painful. The patient would not yield to an operation and the condition went from bad to worse. In January, 1897, complete paralysis of the left facial and of the recurrent laryngeal nerves had developed. About the same time several deep-seated abscesses formed in the neck, one of which was opened through the mouth, the other from without. The patient complained of pain in the occiput, and occasionally on the right side of the head. He died in May, 1897, of general exhaustion. The hearing had been destroyed early in the disease. Dizziness was complained of but once and at no time was there any nausea or vomiting.

The autopsy showed involvement of a much larger area than was suspected. The disease had spread, particularly in the direction of the occiput. Upon removing the apparently healthy brain, the posterior fossa of the skull of the left side and the basilar process were covered with a yellowish grumous mass. Beneath this, the dura was intact. After its removal, the soft growth of the bone could be seen. The process could be traced as far forward as the spheno-maxillary fossa, which was filled with a tumor mass. The entire mastoid and neighboring squamous bone was converted into one mass. Upon removing the firmly adherent dura from over the tegmen tympani, the same tissue was seen filling out the entire tympanic cavity, the ossicles being absent. On the inner wall of the tympanic cavity the exposed facial nerve could be seen. The carotid artery, after becoming greatly narrowed, terminated abruptly in the growth at a point corresponding to the position of the tip of the petrous bone. Only a vestige of the lateral sinus could be found. A microscopic examination showed the tumor to be a typical alveolar carcinoma with pronounced epithelial pearls.

CASE 2.—A well preserved female, seventy-seven years old, whose history could be traced back seventeen years, when an otorrhœa of the left side began, which existed until her death. The diagnosis of carcinoma was made in August, 1891, at the University Clinic of Berlin, where she was treated by local medication (pulv. sabinæ). When I first saw her the entire ear canal was filled with rather firm, grayish-red vascular tissue. There was some tenderness over the tip of the mastoid and a small gland could be felt at the angle of the jaw. Portions of the mass filling the ear canal were subjected to microscopic examination and were found to be made up of numerous acini, lined with cubical or cylindrical cells. No flattened epithelium or epithelial pearls were found. Where portions of the tissue were removed, the gaps were rapidly filled by new growth. Notwithstanding this exuberance, the disease showed no tendency to spread to the auricle. As the case progressed, numerous deep-seated abscesses developed in the side of the neck, which had to be evacuated. Metastatic abscesses had also developed in the lungs and the right thigh. The patient finally died in November, 1898, of meningitis. The cause of the meningeal inflammation could not be determined, as the tumors were sharply defined and had nowhere perforated the dura or caused erosion of the bone. The microscopic examination made after death corresponded on the whole with the previous investigation. The glandular character was less marked in the last specimen and some nests of epithelial cells were visible.

CASE 3.—A female, aged sixty-three years, applied for treatment for a hemorrhage from one of the ear canals, so profuse that an otoscopic examination was not possible. Near the external ostium some granulation tissue was visible, while the region in front of the tragus was thickened. The patient gave no history of otorrhœa, but complained of a frequent feeling of fulness in the affected ear, which caused her to pick and irritate the canal. I suspected the presence of a malignant condition but, owing to the presence of blood, could secure no tissue for microscopic examination. After absenting herself from the clinic for six weeks, the patient returned in a much worse condition than at her last visit. A complete facial paralysis had developed upon the affected side. The mastoid was painful and, although not swollen, was tender on pressure. The entire auditory canal was filled with granulation tissue, which was adherent to the surrounding structures. The tissue was shown by the microscope to be a vascular typical epithelial tumor.

The patient suffered severe pains from which she could get no relief by medication. At her solicitation I finally operated upon the mastoid in the hope of lessening pain. After removing about 1 *cm* of sclerotic bone over the region of the antrum I came upon very vascular granulation tissue. The antrum could not be located, but in its place two sequestra of bone were found and removed, the one presumably from the posterior wall of the ear canal, the other from the tegmen tympani. As the process seemed to extend forward, as was indicated by the passing of a probe, I decided not to proceed further with the operation. The anticipated relief of pain did not follow. The growth, on the other hand, began to spread more rapidly, especially in the direction of the parotid gland, which resulted in a luxation of the lower jaw. Death resulted of general exhaustion in September, three months after beginning of the trouble. A subsequent examination showed that the growth had involved a large area, including the entire squamous bone and all of the mastoid except its posterior border. The sigmoid sinus was empty and collapsed, and the internal carotid artery was partially occluded by a coagulum. Anteriorly the mass extended into the parotid gland. The dura though raised in several places was nowhere perforated. The portion of the tumor involving the parotid differed microscopically from the rest of the tumor in having less epithelial clusters, the epithelium being arranged in parallel columns between bands of connective tissue.

The metastatic tumors found in the pleura were made up of diffusely arranged epithelial cells with a few arranged in nests.

The question of the origin of carcinoma of the ear has always been one of much interest. It bears especially a practical interest on account of the possibility of a prompt extirpation in early diagnosed cases. It is known that carcinoma may spring from the middle or external ear. If it starts in the auricle it can readily be detected. If deep in the auditory canal it is almost impossible to determine whether it took its origin from the canal or the tympanic cavity. The cases on record would indicate that the most common point of origin is the tympanic cavity, for they nearly all give a history of a long-standing otorrhœa — as in my cases Nos. 1 and 2.[1] The malignant nature of tumors of the ear is oftentimes not recognized until after operation upon the mastoid, presumably for simple caries, when it is indicated by rapid spreading of the destructive process. Of sixteen cases cited from literature by Kretschman eleven were preceded by otorrhœa of long standing. This clinical fact is, however, not evidence enough in favor of an intratympanic origin, for usually by the time the cases are seen the growth has spread so as to make it impossible to determine whether it had its starting-point in the skin of the ear canal or the mucous membrane of the tympanic cavity. The microscope throws but little light on this point, as growths with the formation of epithelial pearls can spring from either place. Although there is still question as to which variety of epithelium normally exists in the middle ear it is known that squamous epithelium grows from the skin into the tympanic cavity in old cases of otorrhœa. This would account for the epithelial character of tumors arising in the tympanic cavity. Undoubtedly there are many cases which spring from the skin of the auditory canal. By the continued irritation of the skin by the pus, it becomes susceptible to the development of epithelioma just as the lips become susceptible in pipe smokers. Eczema of the auditory canal and the auricle, which is not an uncommon accompaniment of chronic otorrhœa, also furnishes a favorable nidus for the development of a malignant condition. The predilection of malignant growths for parts where the skin and mucous membrane meet would further strengthen the belief that the lower end of the ear canal is not an uncommon point of origin of such tumors. If the tumor is of a glandular type we can say almost with certainty that it emanated from the ear canal, as the existence of glands in the mucous membrane of the tympanic cavity has not been proven. Jurka reports a case of primary carcinoma of the auditory canal seen in Schwartze's clinic, which contained characteristic gland acini lined with epithelium. Two similar cases were reported by Haug, one of which he described as simple adenoma. In the other, which he reported as adeno-carcinoma, the patient had noticed the development of a nodule for about a year before presenting himself for treatment. The condition finally became painful, began to grow rapidly and show the characteristic serous exudation on the surface. Haug found that it was limited to the inferior wall of the ear canal anteriorly. The microscope determined the malignant nature of the tumor. It was made up of epithelial cells with a fibrous stroma, portions of which had undergone mucoid degeneration. Near the surface the cells were arranged in parallel pillars while in the depth a number of epithelial pearls were visible. Near the surface sweat glands were also to be seen, some of them beginning to lose their histological characteristics. The outcome of this case was not published.

---

[1] In my other case the absence of otorrhœa and the early swelling of the tragus would indicate that it had emanated from the ear canal. The possibility of an origin in the parotid gland and a rapid extension to the auditory canal should, however, not be overlooked.

Haug's other case also gave a history of an excrescence in the ear canal for about a year. The growth was divided into lobules by trabeculæ of connective tissue, plainly visible with the microscope. Delicate bands also entered the lobules and subdivided these into irregular smaller compartments. In them coils and columns of epithelial cells were observed. There was such striking resemblance between these acini and the normal gland structure of the ear that the diagnosis of this case must be looked upon with suspicion.

A case very similar in its pathology to the last was reported by Denker. In a section through the tumor and the membranous canal, which was removed in toto, an enlarged sudoriferous gland and a sebaceous gland were to be seen. Between them the cells were arranged irregularly, showing some resemblance to gland structure. Denker looked upon this as an adenoma in the beginning of a carcinomatous degeneration. From the history of the case the author comes to the conclusion that the malignant condition was superinduced by an attack of influenza. The patient had first observed a wart in the ear canal in 1890. This was removed in 1891 but left an ulcerated surface which was curetted several months later with apparent cure of the condition. The ulcer returned and healed several times after curettement until November, 1893, when after an attack of influenza it began to spread rapidly. When operated upon by Denker in February, 1894, the entire membranous ear canal was involved, extending outward to the helix.

There is no longer any doubt that adenomata often become carcinomatous particularly when the individual becomes debilitated through some constitutional disturbance, as in the case of Denker through influenza. This transformation of adenoma into a malignant growth is so frequent that Birch-Hirschfeld advises a radical operation in every case of adenoma. My case, No. 2, is a representative of this variety of tumor. It had a markedly glandular character and later became infiltrated with epithelial cells, some of which were arranged in typical clusters. The clinical history of invasion of the mastoid and swelling of the glands was further evidence of a malignant condition.

In determining the nature of tumors their clinical course should always be considered, as the microscopical examination is not reliable enough to depend entirely upon it. Ziegler has called attention to the fact that abnormal epithelial developments may take place in the body which may readily be mistaken for carcinoma. This may happen in broken epithelial surfaces which are regenerating—as in wounds of the skin — where clusters and acini of cells develop which show a marked resemblance to the arrangement met with in carcinoma. This would explain the peculiar course of a case reported by Kuhn which to all appearances was cancerous. A small granulating area remained on the posterior ear canal for three and one-half years after a mastoid operation for antral empyema. Notwithstanding its repeated removal and cauterization it always returned. The microscope showed epithelial pegs, dipping from the surface into the depth of the tissue, and in several places epithelial pearls. There was no alveolar or glandular arrangement and during the three years of its existence there was never any glandular enlargement or constitutional symptoms to indicate a cancerous condition.

Kuhn believes that we should not consider cases, diagnosed by the microscope as epithelioma, malignant without their clinical course. In support of this he cites a case of ulceration of the ear canal with enlargement of glands, diagnosed microscopically as cancerous, which afterward by its rapid cure under mercurial treatment proved to be syphilitic.

The possibility of benign growths becoming malignant gains support in the course of carcinomata of the ear, many of which do not show themselves to be malignant until after opening of the mastoid for abscess or other conditions. In Kretschmann's sixteen cases five were not recognized as malignant until after the mastoid operation, and out of six cases at Schwartze's clinic but half of the number were recognized as such before the operation. One of Kuhn's cases also furnishes a striking example of this kind. A man of fifty-nine years with a history of otorrhœa since childhood was operated upon on account of symptoms of pus retention. The bone was found to be very dense and hard and contained no granulation tissue and little pus. Three months after the operation small hard granulations were observed springing from the depth of the wound. They developed with such rapidity that the patient died two months later. The autopsy showed that the anterior part of the tympanic cavity and the front wall of the ear canal were not involved in the process, indicating that the origin of the growth had been in the wound itself. This case is instructive principally because it shows that the development of cancer may be looked for in cases of mastoid operation with retarded repair.

Many other facts might be enumerated to show how very obscure the pathology of cancer of the ear is today. There are cases on record, for example, which have been reported cured by local applications of alum and powdered savin. The cure was so rapid in one instance that the case will bear brief mention. It was reported by Bürkner. The carcinoma appeared on the drum membrane as a nodule of granulation tissue. Five weeks after its appearance local treatment with savin was instituted and in a very short time the exhuberant tissue had disappeared and the perforation in the drum had closed. Up to the time that the case was reported—three years after treatment—there had not been a recurrence. The rapid development and cure of this case would lead one to infer that the author was dealing with a simple granulation tumor with a deep epithelial covering and that there had been a mistake in the diagnosis. However, Jacobson also reports a growth which was held in abeyance by similar treatment. A man of thirty-one years had observed a growth in his ear canal for three months which was removed several times, each time to reappear. It finally grew so fast that it filled the entire ear canal and involved the neighboring lymphatic glands. With the microscope it was diagnosed as a typical epithelial carcinoma. Local treatment with alum and powdered savin was employed constantly for fifteen months with the result that the growth ceased to enlarge and the pain abated. While Jacobson attributes this to the local medication, my second case shows that cases may apparently remain stationary for a number of years without treatment of any kind. This case was kept under observation for seven years in which time there was little or no extension.

Billroth has called attention to the slowness of growth of cancer in old persons and believes that the slowness increases as the patient becomes older. Age may have been a factor in the slow development of my case although I am inclined to believe that the tumor was for many years non-malignant (adenoma) and this accounted for its insidious development.

Returning to my cases I would point out several features of interest. The limitation of all of the tumors by the dura corroborate a point made by Kretschmann that tumors often reach the dura but seldom perforate it. A more uncommon feature was observed in the first case in the early paralysis of the recurrent laryngeal nerve, probably brought on by pressure of the enlarged glands of the neck. The condition of the blood-vessels in this case was also interesting. The almost complete obliteration of the sigmoid sinus and the abrupt termination of the carotid at the base of the skull must have developed very slowly as there was never any congestion to indicate a rapid obstruction. When we [illegible] conditions [illegible] that [illegible] cases [illegible] have [illegible]

[illegible] of in- [illegible] and an [illegible] has not [illegible] a [illegible] permanent cure. [illegible] six [illegible] and [illegible] similar [illegible] been en- [illegible] approve of [illegible] measures only

ADENOID OPERATION ON THE PENDENT HEAD UNDER GENERAL ANÆSTHESIA.[1]

By Dr. P. RUDLOFF, Wiesbaden.

Translated and abridged by Dr. C. Mund, New York.

IN his paper at the third Congress of the German Surgical Society, 1874, Rose suggested the pendent position of the head for all operations in which there would be a tendency of the blood to flow into the pharynx and thus into the air passages. This method of operating at the pendent head, described in vols. xvii. and xxiv. of the *Archiv für Clin. Chirurgie*, excludes the danger of inspiration of blood and fragments of detached tissue. It therefore was readily adopted by the surgeons for operations on the head, neck, and throat, viz., uranoplasty, staphylorraphy, laryngotomy, etc., and is also employed in the operation for adenoids.

The method is as follows: The patient, fully anæsthetized, is put to the end of the operating table in the recumbent position as far as his shoulders, so as to allow the head to hang over the edge of the table. Whilst according to Rose the head is held in a vertical position, I prefer to have it in a slanting, so as to facilitate the introduction of the ring-knife. The left index-finger, protected by a Langenbeck's finger-shield, is introduced into the left angle of the patient's mouth and his tongue pulled forward with a bullet forceps. The extent and situation of the adenoid growth having been located by digital exploration, Boecker's ring-knife is introduced into the pharynx. The cutting edge of the instrument is applied to the upper and central part of the growth and with moderate pressure moved over the fornix and posterior pharyngeal wall down as far as the attachment goes, after which it is removed with the detached adenoid tissue. A second and a third sweep with the ring-knife, one to the right and the other to the left of the first one, are made. A re-examination of the naso-pharynx now, as a rule, will show that, although the main mass of the growth has been removed, some remnants of adenoid tissue have been left behind at the fornix and in Rosenmüller's fossæ. At times these remnants are situated deep within the fossæ of Rosenmüller, on their anterior wall as far as the eustachian ridge and somewhat below in the groove of mucous membrane, which from here runs downward. The larger remnants, about pea-sized, are now removed with Boecker's ring-knife. The smaller remnants are removed by means of Hartmann's ring-knife in the following manner: Beginning at the entrance of Rosenmüller's fossa, first of one and then of the other side, the instrument is passed along the fornix to the opposite side. Remnants at the tube-entrance and below the fossæ are removed with the same instrument by holding it in a somewhat slanting position, and moving it around the salpingo-pharyngeal fold. Pains must be taken to remove all the remnants. Any forcible pressure is to be avoided, and special care has to be exercised in manipulating the instrument in Rosenmüller's fossæ and about the salpingo-pharyngeal fold.

---

[1] According to a paper read at the eighth meeting of the German Otological Society, Hamburg, May 19 and 20, 1898.

Tonsils, hypertrophied to any degree, ought to be removed a few weeks before the adenoid operation, as such hypertrophied tonsils associated with adenoids greatly impede breathing and are apt to favor or even produce asphyxia during anæsthesia.

During the operation the blood flows into the choanæ through the nose, and from there into the pail on the floor. In case the blood, owing to the slanting position of the head, should accumulate in the naso-pharynx, and from there ascend into the oral cavity, the assistant pulls the patient's tongue forward and removes the blood by means of a sponge fastened to a forceps. After cessation of the hemorrhage the patient is lifted to the foot end of the table, placed on his side, having his face turned downward, on an incline so as to allow the dripping blood to flow out through the nostrils. In case of a more profuse hemorrhage the bleeding can readily be checked by means of Bellocque's canula. As soon as the anæsthesia has passed off sufficiently, the patient is directed to open his mouth and his pharynx is examined by inspection, as it sometimes happens that a fragment of adenoid tissue, loosened by the cutting edge of the ring-knife, still remains attached to the posterior pharyngeal wall by a tissue-bridge so to speak. In that case the remnant can be seen at its dependent part in line with the point of the uvula or lower. It then is removed by means of Hartmann's conchotome.

Above I mentioned that in rare cases the adenoid tissue had its origin in the fossæ of Rosenmüller. This statement is in contradiction with the view which Trautmann expresses in regard to this point in Schwartze's text book on *Otologie*, vol. ii., p. 137. According to Trautmann adenoid tissue, although it may fill up the fossæ of Rosenmüller, does not have its origin therein. The specimens exhibited by me during the forenoon session prove, however, the fact that adenoid tissue is found to occupy the eustachian ridge. These observations correspond also with those of other authors, viz.: W. Meyer, Wendt, Disse, v. Lange, Hopmann, Schäffer, Bresgen, Gottstein, and Kayser. Therefore should the indication arise for entering the fossæ of Rosenmüller with an instrument, the operator must be careful to avoid an injury to the eustachian walls.

Of very grave significance in relation to the manipulation in question, is an accident, to which attention has not yet been called by practitioners but by anatomists only (Zuckerkandel and Merkel), viz., the danger of wounding the carotid in operations about the pharynx. In his handbook of topographical anatomy, vol. i., page 407, Merkel, citing the statement of Zuckerkandel relative to the danger of wounding the carotid, adds that this danger really is a great one. The sporadic cases of fatal hemorrhage in connection with adenoid operations mentioned in literature have induced me to pay special attention to this fact. So far, however, the case described by Schmiegelow is the only one in which an account of a post-mortem was given or in which reference was made as to the possible cause of this grave accident. The case mentioned was a boy twelve years old, who was operated on, not by Schmiegelow, but by some one else. During the operation,—without anæsthesia,— after Gottstein's ring-knife had been introduced into the naso-pharynx three or four times, a severe and almost immediately fatal hemorrhage resulted. The autopsy showed an injury to the lateral wall of the naso-pharynx and a rent in the wall of the carotid just below its entrance into the carotid canal, at a point not corresponding to the part of the pharyngeal wall which had been wounded. A microscopical examination of the wall of the carotid had not been made. The accident probably happened this way: At the moment in which the ring-knife had penetrated the lateral wall of the naso-pharynx the artery, filled to its utmost tension, struck against the rim of the instrument, or the instrument having pierced the lateral wall of Rosenmüller's fossa was forcibly pressed against the artery as it was filled to its utmost tension, and thus the wall of the vessel was severed. The question as to whether possibly a diseased condition of the wall of the artery facilitated this accident or not can only be conjectured.

In consequence of this unhappy event our attention is naturally drawn to the topographical relations of Rosenmüller's fossæ to the carotid artery. Merkel mentions these relations in his handbook. According to his view the connective tissue enveloping the vessels and nerves is blended with the lateral wall of the recessus infundibuliformis to such an extent that in dissecting from without, it is utterly impossible to distinguish where the boundary between the two exists. I have had the opportunity to follow up these relations in a number of specimens which, having all been taken from adults, corroborated the description of Merkel.

This is not the case with children. According to the observations of Disse placed at my disposal, the carotid passes at a certain distance from the recessus infundibuliformis and does not approach the wall of Rosenmüller's fossa until after advanced development of the latter. These fossæ are almost fully developed at about the age of five years, and it is after this age that the majority of patients are operated upon. We therefore have to consider these conditions, and it is evident that an injury to the lateral walls of Rosenmüller's fossæ may result in a wounding of the carotid. The possibility of this accident, however, is excluded if in clearing Rosenmüller's fossæ the above method is followed.

Special pains must be taken to perform as radical an operation as possible, and this for two reasons: In the first place, we endeavor to avert a repetition of the operation. Secondly, we have to consider the view expressed by McBride and Delavan, that the occurrence of tuberculosis,[1] a fact confirmed by numerous observers, in the tissue of the hyperplastic pharyngeal tonsil, compels us to operate radically. With this thorough procedure I but very seldom have been obliged to perform the operation a second time. My experience corroborates the statistics confirmed by Gleitsmann, in America, and the results stated by Moritz Schmidt, of Frankfort-on-the-Main, in his text-book.

I sometimes perform the operation without general anæsthesia. The following are the conditions under which I always employ general anæsthesia. In cases of excited and timid children, in children afflicted with nervous complaints, and under certain anatomical conditions of the naso-pharynx, viz.: When the posterior wall and roof of the naso-pharynx form a slight angular bend at the fornix pharyngis instead of having a curved line in running from one into another; furthermore when the anterior atlas prominence projects somewhat into the naso-pharynx. Attention to both of these abnormal conditions was called by Merkel, Zuckerkandel, and others. I observed them chiefly in several cases operated upon by others where repeated operations had proved a failure. A lady, for example, of fifty years of age, had with remarkable patience, put up with such operative procedure for weeks without having been freed of her trouble. With the aid of the method described above, it was an easy matter to thoroughly remove the adenoid vegetations, which were situated in the hollow above the projecting curve of the atlas. These anatomical abnormalities induced Merkel in his description of the anatomy of the naso-pharynx to make the following statement: In consideration of the variation of the anatomical relations in different individuals it is evident that the surgical instruments which we introduce into the naso-pharynx cannot be manufactured with a typical and unchangeable curve, but the curve should be adapted to the case.

---

[1] HYNITSCH, in his compilation (these ARCHIVES, vol. xxix., p. 357, 1900), found 7 cases of 180, *i. e.*, 4 per cent.

WEX (in the same volume, p. 442) found tuberculosis in 33 cases out of 599, *i. e.*, 5.51 per cent.—H. K., *Editor*.

To this I may add that we should not only have at our disposal various instruments, in the manipulation of which we are skilled, but we should master different methods of operation in order to select the most suitable for a given case.

TYMPANIC VERTIGO DUE TO OBSTRUCTION WITHIN THE EUSTACHIAN TUBE.[1]

By Dr. WM. P. BRANDEGEE, New York.

UNDOUBTEDLY the most prominent and at the same time the most common and distressing symptom of labyrinthine disturbance is vertigo. Clinicians have for some time decided that this affection may result from or complicate certain disorders which may well be divided into four great classes, that is to say: Vertigo may be incident upon, first, diseases functional or organic, of the heart or circulatory apparatus; second, diseases of the stomach and intestinal tract; third, diseases of the eye; fourth, diseases of the ear. It is not the purpose of the writer, nor is it within the scope of this short paper to touch at all upon vertigo in connection with the first three of these classes, but rather to call attention to the prominence of this symptom in a certain group of aural cases.

Diseases of the internal ear are properly divided into primary and secondary affections, and while the primary disorders are comparatively rare, the secondary affections are quite as comparatively common. Broadly speaking, aural vertigo usually accompanies, when it occurs at all, one or more of the cardinal symptoms which the aural patient presents, that is to say: either impairment of function, perversion of function, otorrhœa or pain. One author has well said that "it is a well-recognized fact that secondary labyrinthine disturbance may occur as a complication or sequel of changes within the middle ear or Eustachian tube, and that this disturbance requires only treatment directed to the middle ear. This latter fact does not make it less a labyrinthine affection, the removal of the cause being the rational method for overcoming this disturbance." To vertigo, then, as a symptom caused by tympanic change, and this condition in turn induced either by absolute stenosis of or obstruction within the Eustachian tube, and to a rational method of dealing with this tubal affection, I would especially call your attention.

---

[1] Read before the Section on Otology, at the N. Y. Academy of Medicine, March 13, 1901.

Patients, suffering from labyrinthine involvement due to tympanic change, usually give a subjective history, lasting in most cases over a long period, of co-existing catarrhal disorders of the nose and naso-pharynx, frequent colds in the head, accompanied by more or less temporary impairment in hearing, stuffy sensations or tinnitus in the ear, and finally a gradually progressive deafness in either one or both ears as time goes on.

Such a history is exceedingly common, an almost everyday occurrence to the aurist taking careful notes of his cases. A subjective history, such as I have described should be carefully considered, and a thorough functional and physical examination should always be made. Especially thorough should be the examination of the Eustachian tube, and this can only be attained by the use of the Eustachian catheter and the auscultation tube. The symptom most commonly associated with vertigo is tinnitus, and the histories of the cases reported will well bear out this assertion. It has been observed with these cases of vertigo that when impairment of function has been present, this impairment has usually been very profound, or but scarcely perceptible.

Tinnitus, rather than vertigo, has been the prominent symptom in those cases where only a moderate impairment of function has existed.

A more careful and extended functional examination will reveal impairment or raising of the lower tone limit in these tubal cases, while the upper tone limit remains practically normal, except in those cases where the labyrinth is greatly involved when the upper tone limit is lowered.

Physical examination generally shows a shrunken or retracted drum-membrane with a slight loss of lustre, the long process of malleus foreshortened and on inflation, without which, as I have said, no examination is complete, a stenosed Eustachian tube or one that is decidedly narrowed.

There is no need here of discussing the pathological processes which have brought about this fibrous stenosis or thickening within the walls of the tube and the consequent middle-ear condition. Suffice it to say that frequent venous hyperæmia, mucous membranes swollen and covered by tenacious and viscid mucus, the destruction of epithelium, the formation of new connective tissue, all these factors are to be considered as bearing a part towards the tubal and middle-ear changes.

Viewed from a mechanical standpoint the result of occlusion of, or narrowing within, the Eustachian tube, upon the tympanum, its contents, and the membranous labyrinth, is interesting.

The air within the tympanum is rapidly absorbed when such an occlusion exists, and diminished atmospheric pressure within the cavity, and an increased atmospheric pressure from without, almost invariably cause the ossicular chain to be driven inward, and so a mechanical pressure is directly conveyed to the membranous labyrinth.

Treatment of tympanic vertigo cases, caused by occlusion, should logically be directed then towards restoring the patency of the tube, and this in itself is a direct mechanical process.

But before discussing treatment, a word or two concerning some of the varied forms of this distressing symptom of labyrinthine disturbance. Patients suffering from even the mildest forms of vertigo are pitiable enough, but what must be the condition when the attacks are so constant and so severe that these people are practically cut off from all the ordinary occupations or pleasures of life, when even existence itself becomes a horror.

In one of these cases reported, the type of vertigo was so severe that the patient, a physician in this city, scarcely dared to go out of doors. It was impossible for him to cross a street without help, and he was obliged to have some kind of support when he assumed an upright position.

Still another case, that of a woman. The attack was of so severe a type that she was confined to her bed the greater portion of the time. On attempting to assume an upright position she would pitch over.

And in still another case, the man could only walk in a dragging and halting manner, and that with the support of a cane, and the guiding arm of a friend.

In the milder cases reported, the labyrinthine involvement although well marked, was described by the patient as being attacks of light-headedness, dizziness or a swimming sensation. Nausea seldom accompanied this disturbance, but was quite frequently noticed at the time of treatment, and was probably due to irritation of the naso-pharyngeal mucous membrane. Unless we have to deal with constitutional diathesis, drugs are of little benefit in this class of cases, and the treatment, as I have already said, must be direct and mechanical, all effort being toward restoration of patency of the tube. The best way of accomplishing this end, to the writer's mind, is electrolysis, following the method devised by Duel of this city.

Right here let it be said, that in dealing with cases of tubal obstruction a great deal of benefit can be derived from the use of bougies whether they be made of whalebone, celluloid, wire or what not, in forcibly breaking down stenoses or in stretching narrow tubes, but the writer firmly believes that electrolysis is by far the best method of accomplishing the end desired.

What are the advantages of the electrolytic method? They are briefly as follows: First, ease of manipulation. Second, a minimum amount of pain to the patient. Third, a minimum amount of trauma to the parts involved. Fourth, thorough destruction of the stricture or occlusion. Fifth, the force necessary is only that sufficient to insure good contact for the current. Sixth, the parts of the apparatus which come in contact with the tube can be readily rendered sterile.

The instruments devised by Duel have been exhibited here before so that there is no necessity of further description. It may only be said, however, that the smallest bougie is the one to be generally preferred for the first treatment, the larger sizes for subsequent sittings.

When the mouth of the tube is well anæsthetized with cocaine, a result easily obtained when a ten per cent. solution is applied to the part by means of a small pledget of cotton on an applicator, a silver catheter, well insulated by thin rubber tissue and containing the small gold bougie can easily be introduced well into the tube.

The operator can then slowly and almost painlessly pass through any stenoses or narrowing in the tube, and he should be positive that the bougie has passed into the tympanum This is absolutely essential because not infrequently the stricture is met with only at the tympanic orifice.

It should be distinctly understood that electrolysis, not cauterization, of the tube is desired, that to produce this effect, only a very mild current with a comparatively low voltage should be used. When such a current is employed no damage can be done to the epithelium, and the stenosis seemingly melts away.

Not infrequently the patient will notice that the obstruction has been broken down, and that the vertigo has at the same time disappeared.

Experience has taught that it is not well to use the electric bougie too frequently in succession ; that no excessive force should be employed, but only that necessary to obtain perfect contact (for the current is doing the work, not the pressure); that inflation by the catheter should not be attempted for at least forty-eight hours after treatment on account of the slight reaction, and for fear of emphysema; again that it is often quite necessary to bougie several times before we obtain a perfectly smooth and patent tube, and finally that catheter and bougie should be sterilized by boiling. After the patency of the tube has been established, air and vapor massage by the catheter is indicated, while attention should be given to the adjacent cavities of the nose, oro-pharynx and naso-pharynx, local surgical procedures being adopted when necessary.

The results following the use of electrolysis in these cases of tympanic vertigo have been surprising, not only to the patients themselves, but it must be admitted also, to the operator, and the only excuse for this paper is that it may bring the method to the attention of other practitioners who desire to rid their patients of a most distressing and annoying disorder.

I beg leave to report the following cases in which the histories have been carefully kept, and although the number may be small, still the marked benefit derived in all of them from electrolysis justifies the confidence placed in the method. Some of these cases are from private practice, while others appeared in the service of Dr. Dench at the New York Eye and Ear Infirmary, where they came under the observation of Dr. Kenefick and the writer.

CASES.

CASE 1.—H. T. Male, forty-seven years of age, physician. Patient presented complaining of some tinnitus and deafness following a severe attack of grippe. Vertigo was marked and exceedingly severe. Patient feels as if he were falling forward, and to the right. Cannot practice his profession at all. Vertigo referred to right ear. Cannot go out of doors; dares not cross the street, and desires to give up his practice.

Functional examination—right lower-tone limit 512 vd., left lower-tone limit 32 vd. Upper-tone limit both sides 2.8 Galton. Whisper and acoumeter distance almost normal. Bone conduction both side minus.

Physical examination—some retraction of right membrana tympani, some swelling at mouth of tube, decided foreshortening of the long process of malleus; right tube stenosed, inflation absolutely impossible. Electrolysis by the Duel method done four times within a period of two weeks. Average amount of current three milliampères of 35 volts. Longest time of contact three minutes.

Vertigo has entirely disappeared; the lower-tone limit of the affected side has fallen to 64 vd. Whisper normal, no tinnitus. The patient has lost his worried and anxious look, and walks with firm buoyant step. On the 8th of February last, ten months from the time that he was discharged from the office, the patient again reported complaining of some light-headedness. Catheter inflation showed slight narrowing of the right tube. Electrolysis twice in one week; result, a patent tube through which air passes perfectly into the tympanum, and the dizziness gone.

The stricture in this case was in the cartilaginous tube just internal to the isthmus.

CASE 2.—K. R. Female, thirty years of age, artist. This is one of the most stubborn cases I have ever had to treat. The aural history was as follows: Deafness both ears seven years. Tinnitus both ears for same length of time, and for past three years vertigo so pronounced that she was unable to get out of her bed, or take any care of her business affairs. Has autumnal hay fever, chronic hypertrophic rhinitis, also chronic nasopharyngitis.

Functional examination—lower-tone limit right $C=128$ vd., left $C^2=512$ vd. Bone conduction both sides minus. Upper-tone limit both sides 4 Galton. Loud voice distance, right 1½ feet, left two inches. Physical examination—catheter and auscultation tube reveal stenosed tube on both sides. Electrolysis by bougie begun promptly, and continued on an average of about three times a month for four months, while inflation was practised steadily. The strictures in both tubes were of the long annular variety, and progress was exceedingly slow. The fact of the matter is that very little in the way of improvement was hoped for or expected. At the end of the first month, however, to my surprise, and to the patient's great relief, the vertigo absolutely disappeared. This patient has been under treatment now for the last two years, off and on, and when last seen, in January of the present year, vertigo was still absent, tinnitus very much better, and confined now to left ear, while the patient is able to hear the loud voice ten feet on the right side, eight feet on the left. The lower-tone limit has slowly fallen on the right side to 64 vd., on the left to 64 vd. Both tubes are patent, but still narrow.

CASE 3.—B. M. Female, twenty-nine years of age, schoolteacher. Aural history—deafness right ear two years, left ear slight impairment one month. Tinnitus both ears. Vertigo well marked, of the swimming variety. Malarial diathesis. Functional examination—lower-tone limit both sides 32 vd. Whisper right 12 feet, left 15 feet. Upper-tone limit both sides normal. Physical examination—slight retraction of drum-membrane both ears, more marked on right side. Tubes, right very narrow, left patent. Electrolysis of right tube done twice in one week, dizziness entirely gone, tinnitus decidedly better, still under observation. This case is of the mild type.

CASE 4.—F. B. Male, forty-two years of age, longshoreman. Specific history of long standing—aural history as follows: Slight impairment of hearing for the last ten months in right ear, tinnitus also in right ear for the same length of time, marked vertigo, referred to right ear, constantly for the last three months. Functional examination—lower-tone limit right 512 vd., left normal, upper-tone limit right 3.8 Galton, left normal. Whisper distance right after inflation, one foot. Physical examination—retracted and dull drum membrane on the right side. Electrolysis right tube done four times. Tinnitus gone; vertigo disappeared entirely, whisper right 25 feet. The stricture was at the inside of the isthmus, and the bougie was passed at intervals of every third week, six times in all.

CASE 5.—S. G. Male, fifty-two years of age, salesman. Aural history—impairment of hearing both sides seven years; constant tinnitus, constant vertigo. Functional examination—lower-tone limit right and left 512 vd. Upper-tone limit right and left 2.8 Galton. Acoumeter heard only on contact both sides. Very loud voice right side two inches, left side 14 inches. Physical examination—dull and retracted drum-membrane both sides. Eustachian tubes both closed. After fourth application of the bougie, tinnitus had disappeared, and the vertigo was absolutely gone. Has been bougied altogether about ten times during six months. A functional test taken on February 13th shows that the lower-tone limit has dropped to 64 vd. on both sides, while whisper distance, not the loud voice, is 12 inches on the right, 3 feet on the left.

CASE 6.—A. J. Female, age forty-six, housewife. Aural history as follows: Impairment of hearing on the left side nine months, tinnitus for same time, vertigo most marked, unable to move without an attendant and very much depressed. Right side practically normal. Functional examination—lower-tone limits on both sides 64 vd. Upper-tone limits normal. Whisper distance, left, four feet. Acoumeter distance, left, 15 inches. Physical examination—left drum-membrane markedly retracted, right tube slightly narrowed; left tube absolutely closed by a stricture which was firmly organized. This patient has been bougied about ten times; the stricture was dissolved, and the patency of the tube restored after the third treatment, and at that time the vertigo entirely disappeared. Tinnitus was somewhat improved, and her general physical condition markedly benefited. This patient was exceedingly nervous and apprehensive, but now she looks bright, eats well, sleeps well, and is indeed a changed woman.

There are fourteen cases in the series, the six reported in full above show fairly well the different types of vertigo due entirely to tubal occlusion or obstruction within the Eustachian tube.

A CORRELATION OF ONE HUNDRED SUCCESSIVE MASTOID OPERATIONS.

By EDWIN W. PYLE, M.D., Jersey City,

FELLOW OF THE N. Y. ACADEMY OF MEDICINE. ASSIST. SURGEON N. Y. EYE AND EAR INFIRMARY.

THE following facts are taken from the mastoid operations in Dr. Whiting's clinical service (N. Y. Eye and Ear Infirmary). The cases were successive in the writer's experience, either as operator or as assistant, and the object of this report is to make a practical correlation of the peculiarities, the deductions, and the verifications.

Forty-eight of these were in children, the youngest being seven weeks old.

Fifty-two in adults, the eldest being sixty-seven years.

Peculiar to children were thirty-four subperiosteal accumulations, twenty-five cortical perforations, and nine cases in which pus had escaped through the Rivinian fissure only.

Three subperiosteal fluctuations beneath the temporal fascia, seven Stacke, four Bezold, and two brain abscess operations were peculiar to adults.

Pertaining both to children and adults were five secondary operations, in the primary of which only a small portion of the cortex and underlying cellular structure had been removed, thus verifying the wisdom in complete ablation of the mastoid.

Eleven were radical operations (in which the apophysis, posterior canal wall, and ossicular remnants were removed, seven in adults, four in children). Nine of these gave evidences of cholesteatoma, showing the relative frequency of this complication in chronic cases.

Twenty-two were extradural abscesses. Six in children, following exanthemata (sixteen in adults, due to chronic influences).

Five had sinus thrombosis (one adult, two adolescents, two children, ages four and six years), youth having the preponderance, which is against the rule.

In nineteen cases the middle fossa was exposed.

In thirty the sinus was uncovered (twenty-four by erosion, three by accident, three intentionally.) No meningeal irritation followed these exposures. As asepsis could not be perfect from the very nature of purulent wounds, the inference is that the dura possesses a resisting power to pathogenic invasions greater than most protecting membranes.

Unreliability of Symptoms. In four cases a profuse discharge from the external meatus indicated an amount in excess of tympanic possibilities to secrete, and yet the operation revealed no source of supply in the antrum or in the mastoid cells.

In three cases there was no tenderness over the tip and yet the tip-cell only was filled with pus, showing that the absence of this symptom does not always denote the underlying condition, and perhaps emphasizes that antrum tenderness is the more reliable.

Nine had no discharge of pus from the canal. Six had absence of inflammatory symptoms at the fundus to indicate mastoiditis. In one, pain, tenderness, and œdema decided the operation in which were found an epidural abscess and a Bezold's perforation. In another, hemicrania and inability to sleep were noteworthy symptoms and the operation disclosed extensive necrosis of the groove and a perisinuous abscess. In another, the cicatricial membrana tympani was retracted, short process prominent with tenderness and fluctuation over the mastoid, requiring a radical operation to relieve cholesteatomatous products.

In four cases there was obliteration of the post-auricular fold, pain elicited by motion imparted to the cartilaginous canal, also pain by direct pressure over antrum, tip, and medial plate, symptoms generally accepted as pathognomonic of furunculosis and mastoiditis respectively. These symptoms were due to post-auricular abscesses in the cellular structure of the auricles, with no symptoms suggestive of canal or mastoid involvement.

No. 84 gave history of an acute aural pain lasting *twelve days*, — temp. 103°, pulse 130. The groove was carious to a large extent, extradural granulations abundant, trabeculæ destroyed, and the process one empyæmic mass.

In contradistinction, No. 90 had mastoid tenderness with history of chronic discharge, had had three chills with temp. ranging from 102° to sub-normal with stupor,— advised operation to save life.

Revelations,— no pus, no sinus complication, no brain abscess, everything negative and made a fine recovery.

Relative to the sinus. In four cases the sigmoid groove approached within ⅛″ to ¼″ of the posterior canal wall, and in two the entrance to the antrum was found only by going up over the groove.

These cases illustrate the invariable presence of an antrum, that the sinus may be anywhere, and would have been violated under the ordinary rules respecting safety within the triangle.

In five cases, the bistoury, held in the usual way to cut with the point, rather than with the long edge, would have endangered vital parts which were unprotected by bone.

In one, necrosis of the cortex was so extensive that in raising the periosteum the elevator impinged directly upon the sinus.

In three cases, in opening the apophysis pus welled up in pulsations without there being any exposure of the sinus, showing the unreliability of this suggestive symptom to denote groove involvement.

In one, respiratory movements of the sinus were alarming. While removing a carious groove the descending portion of the sinus suddenly collapsed, as with an inspiration, then violently ballooned outward with the following expiration and so alternated with little apparent distress on part of the patient. (Jansen, Schwartze, and Körner report cases of the same respiratory character.)

This symptom is conceded to indicate the presence of a clot between the point of aspiration and the torcula, or the admission of aërial embolism. In this case the sinus had not been wounded and the subsequent history disproved the presence of any clot.

Five cases out of five of phlebitic thrombosis verified the observation that when the sinus is surrounded by foul pus, a venous clot may be anticipated.

In three instances there were several rigors without sinus involvement, which is against the usual experience.

Several cases demonstrated the delusive influence of cold in treating mastoiditis.

No. 80 had been relieved by leeches, coil, etc., four months ago. Returned with pain, canal full of pus, a low grade of septic fever, with groove well eroded and sinus covered with purulent granulations. Others demonstrated the uselessness of cold and rest when there was severe hemicrania with tenderness in the cerebellar region.

No. 21 was a child four years old, well nourished, had had purulent discharge four weeks following scarlatina. There was tenderness in the post-cervical region, restlessness from pain, *temperature 99°*. No. 55 was an adult with continued hemicrania, mastoid œdema, cerebellar tenderness and *no fever.*

Operations in both disclosed an extensive osteoporosis with perisinuous granulations, verifying the observation that such pain and tenderness, with little or no fever, are quite pathognomonic of extradural abscess.

Complications.—The relative disproportion between operative cases and cerebral exposures is explained by the complications. For example:

No. 88 was an eleven weeks' old babe, had otorrhœa, carious exposure of two fossæ, epidural granulations towards the bulb and an absence of cortex by dehiscence over the knee, exposing the sinus in the descending portion.

No. 98 was a sinus phlebitis complicating brain abscess of the temporo sphenoidal lobe, from which several ounces of pus were evacuated. Temperature on admission was 104°, partially comatose, motor oculi paralysis, optic neuritis, and motor aphasia were pronounced. He knew the use of a pencil, but called it "a chestnut." This pathognomonic symptom of brain abscess did not disappear with the operation. Five weeks after, he would use such expressions as "I can't sleep in the sleep," meaning bed.

In two cases the external semi-circular canals were destroyed by caries, with no history of dizziness, illustrating how admirably nature compensates in slow disintegration.

In two the Fallopian canal was eroded to the extent of exposing the nerve in its entire course through the tympanum. In one it was picked up by a bent probe, introduced to protect it in a radical operation, showing the most cautious manœuvres may be attended by danger.

In one case an extensive suppurative perichondritis complicated after treatment, perhaps due to an incision extending inadvertently into the scaphoid fossa, with infection.

In one a round-cell sarcoma complicated middle-ear inflammation.

Results.—The most appreciable was the *rapid physical improvement* that followed relief of pain, and freedom from septic absorption, fostered by hospital care. Generally, those detained the longest made the most satisfactory recoveries, which emphasizes the fact that institutions best equipped to take care of the body, *caeteris paribus*, will obtain the quickest results in healing.

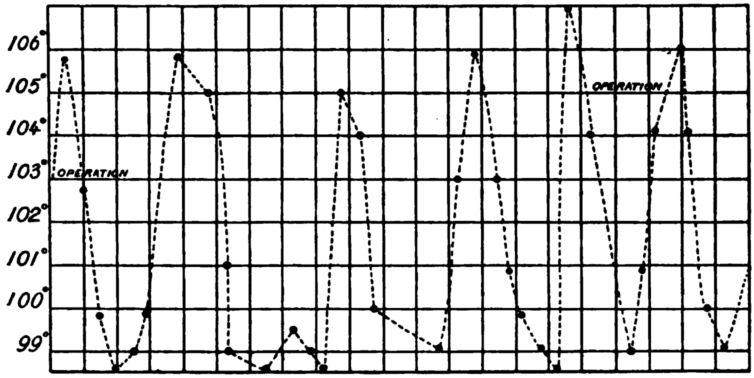
The *average time* in the wards after operation was between five and ten days.

The *most gratifying* and encouraging *cases* were the subperiosteal and the radical operations *in children*. The mortality was 4 %: one adult, of brain abscess, one of leptomeningitis. Two children of sinus thrombosis: one of septic pneumonia, no ligation, the other of longitudinal thrombosis, with ligation.

In every instance an effort was made to perform an absolutely complete operation. An error in this respect may be responsible for one death. Briefly, this child had been twice relieved by Wild's incision; had walked to the clinic with little outward manifestation of ailment. A cholesteatomatous mass was removed and the apophysis thoroughly ablated.

The accompanying chart explains, after verifications, that the patient had on admission, a foul perisinuous abscess and a sinus thrombosis, beneath an apparently normal sigmoid groove, which condition could have been suspected only by a previous temperature record.

There are times when the thermometer gives the only clue for the necessities of sinus invasion. One brain abscess out of two, and three sinus thromboses out of five recovered.



The spaces between dots represent intervals of 2 hours.

Three with partial facial paralysis were *relieved* by operations. Two chronic cases were *followed* by *paralysis ;* one, a secondary with extensive necrosis, appeared on the fourth day,—recovered. One twelve hours after operation, from pressure by packing or exudate on an exposed nerve, with recovery.

Four Stacke cases dermatized readily, all discharges ceased and one was relieved of dizziness that had prevented occupation. Three others were greatly improved, subsequent to the dressing period, by irrigation with hot sterilized water, using one to two quarts at a time, by douche sufficiently elevated to give pressure, under the contractive influence of which soft granulations disappeared, and dermatization took place rapidly.

We note here particularly, that in one radical operation complicated by a recurring, foul cholesteatoma, irrigation as above described secured most gratifying results after a long series of patient experimentations with other measures.

Incisions, dressings, etc.—Excepting in the Stacke operations, the integument was invariably incised at right angles to the primary incision, on a level with the centre of the external meatus, extending posteriorly one inch.

This relieved tissue stress consequent upon retraction, facilitated operation by good exposure, and invariably healed by primary union. Iodoform gauze was used in all first dressings, and discontinued thereafter for the plain sterilized variety, unless there were special reasons for stimulating granulations.

In the radical operations the dressings were made mostly through the canal, and at the earliest possible date the auricle was pressed towards the head, to favor posterior healing and to relieve deformity. As soon as granulations would permit, dermatization was hastened by discarding gauzes, dusting with xeroform and admitting air freely.

Transfusions.—The life-giving impetus of the hot normal-saline solution was manifested in four cases. They were administered through the median cephalic vein at a temperature, in the reservoir, varying from 110° to 125°. The most marked reaction followed the transfusion of thirty-two ounces at the last temperature. Experiments have proven that hæmoglobin is not coagulated under 140 degrees.

Conclusions.—The children, numerically four less than the adults, furnished three times as many acute cases; the adults three times as many chronic cases as the children; illustrating that the greater number of mastoid inflammation, sooner or later, demand surgical interference.

Thirty-seven cases of subperiosteal accumulations and eleven adults giving evidences of having had cortical perforations, show clearly the insufficient efforts nature had made to repair, as they had finally to succumb to operative necessities.

Forty-five acute cases furnished 33 per cent. of the intracranial complications, mostly in children, and all lived.

Fifty-five chronic cases furnished 66 per cent. of the intracranial complications, of which four died: illustrating the value of normal periosteums and phagocytic properties of white corpuscles to resist pathogenic invasion and specializing the importance of prophylactic treatment.

Four cases were operated upon, perhaps too early and ill-advisedly, but beyond the possibility of a doubt, ninety-six would have been vastly benefited by earlier operative procedure.

This verifies other experiences and is a deduction well sustained by this correlation.

EMPYEMA OF THE RIGHT MAXILLARY, ETHMOIDAL, AND SPHENOIDAL SINUSES WITH SUDDEN BLINDNESS OF THE LEFT EYE. OPERATION. RECOVERY OF SIGHT.[1]

By T. H. HALSTED, M.D., Syracuse, N. Y.

IT has long been recognized that that important accessory sinus of the naso-pharynx, the middle ear, perfectly analogous to the other accessory sinuses of the nose, is the cause or starting-point of meningitis, brain abscess, and pyæmia, but comparatively little attention has been given to the sphenoidal and ethmoidal sinuses as points of infection and invasion of the brain as well as of the orbit.

The plate of bone separating the sphenoidal sinus from the sphenoidal fissure is of variable thickness, in some skulls in my possession the thickness in places being less than the paper this is written on. Beaman Douglas has recently called attention to the frequent presence of additional air sinuses in the lesser wings of the sphenoid, making still closer the connection between the air-containing sinuses of the nose and the nerves and vessels passing through the sphenoidal fissure; and there pass through this fissure the third, the fourth, the ophthalmic division of the fifth, and the sixth nerves, some filaments from the sympathetic, and the ophthalmic vein. Thinnest of all, however, is the plate of bone which separates the sphenoidal sinus from the optic foramen, transmitting the optic nerve and the ophthalmic artery.

The barrier between all the accessory sinuses of the nose and the eyeball, the nerves supplying the eye muscles and the optic nerve, is so slight that acute suppuration, empyema, necrosis, and new growths of the sinuses, constantly met with by every rhinologist, must be very frequent factors in the causation of various eye lesions. Holding the skull between one's eye and the light and estimating the thinness of the bone separating the sphenoidal sinus from the optic foramen, one must be struck by the infrequency of reported cases of optic neuritis and blindness resulting from sphenoidal suppuration and abscess, and it must be due to the fact that this sinus and its diseases have been greatly overlooked or underestimated as to their ability to occasion eye diseases.

---

[1] Read before the American Laryngological, Rhinological, and Otological Society, New York, May 23, 1901.

During the past three to five years, and more especially in the past year, very many cases have been reported showing this intimate relation between sinus disease as a cause and eye lesion as a result, and, without doubt, the sinuses will very soon receive the general recognition they deserve.

The case which I report is of more than usual interest because the suppuration of the various sinuses of the nose was on the right side and gave occasion to no ocular symptoms until suddenly blindness developed on the opposite or left side.

Mrs. G. M., æt. twenty-one years, was brought to my office at 11 A.M. on Nov. 1, 1900, by the late Dr. U. H. Brown. The patient had been under Dr. Brown's care for some time for a catarrhal affection of the right side of the nose, the last treatment being two days before, when the nose was sprayed. The night before I saw her with him she had been to a dancing party, feeling perfectly well and without any symptoms referable to her eyes. Dr. Brown, who was an ophthalmologist, had never, up to this time, had occasion to examine her eyes. This morning, however, she awakened at 6 o'clock, and at once discovered that she was totally blind in the left eye, and early that morning called at his office. He found the following condition of the fundus as taken from his case book: "Exudation into sheath left optic nerve, veins enlarged and tortuous, arteries diminished in calibre. Vision, quantitative perception of light. Nerve head seen best with + 7 D. Left pupil dilated and responds but little to ophthalmoscopic light reflex."

She gave the following history. For about two years she had had some nasal catarrh and had at various times been treated for it by different physicians. Six months ago, while in the Adirondacks, contracted a more than usually severe "cold in the head." The right side of the face at the beginning of it was swollen and tender, quite acute pain over and around the right eye, a profuse, yellowish, and odorous discharge from the right side of the nose. Because of this persistent pain, discharge, and odor, she left the woods and went to Utica for treatment, but remained there but a few days, as she thought she was not benefited, and returned to the Adirondacks, where she remained most of the summer. During the summer there was a continuous discharge of odorous, yellow pus blown from the right side of the nose, with more or less postnasal discharge of the same character, nasal obstruction on the right side, more or less pain over the right eye, especially forenoons, insomnia requiring trional every few nights, general malaise, and occasional chilliness. There was neither pain nor discharge on the left side. On returning to the city in the early part of September, she placed herself under Dr. Brown's care. The Doctor stated that in the two months he treated her she had a very profuse discharge of pus coming from the right middle meatus, but he had not determined its origin. He had never seen any at any time on the left side.

The patient and her husband both remarked that while formerly she soiled during a forenoon five or six large handkerchiefs, this morning less than one had been soiled, and most of this had come from the left side, almost none from the right.

On examining the nose, I found the following condition : *Right side*—general deviation of the septum to the right, greatest deflection being in the upper part. Inferior turbinate swollen. Middle turbinate could not be seen because of the deflected septum and swollen inferior turbinate ; pus covering the latter and coming from above. *Left side* was clear, septum slightly concave, no enlargement, swelling, or pressure of the middle turbinate against the septum or outer wall. No pus in the superior or middle meatus, but there was some on the floor under the inferior turbinate. Slight amount of pus on the posterior wall of the naso-pharynx, but it could not be traced to any definite point. Tonsils slightly enlarged. After using a 10 % solution of cocaine and cleaning away the secretion, I was able to see the anterior edge of the right middle turbinate, and on pressing the septum over got a fairly good view of the middle meatus, finding that the pus was coming from under the middle turbinate. The probe could not detect bare bone, and in a very few minutes the swollen mucous membrane again obscured the middle turbinate. With electric transillumination, the right maxillary sinus was completely dark, with no pupillary glow, whereas the left antrum was very translucent, the pupil being bright. Both frontal sinuses very translucent. Tenderness on palpation over the right antrum, at the inner canthus, and above the right eye. No fulness to be detected. No pain or tenderness on the left side, but a feeling of fulness and pressure back of left eyeball. The left pupil was widely dilated, did not respond to reflected artificial light thrown into it, but contracted when light was thrown into right eye, showing that the third nerve was not involved. Unable to distinguish objects or count fingers held in front of the eye and could perceive light only out of the outer angle. Distinct exophthalmus, the eye being very perceptibly pushed forward and slightly outward. Right eye unaffected. Temperature, 99.4° F. Pulse, 82. I made a diagnosis of empyema of the right antrum, right ethmoidal and sphenoidal sinuses, with a recent rupture or breaking through of the septum between the two sphenoidal sinuses, allowing the pus to distend the left sphenoidal cavity, causing either a bulging of the outer wall of the sinus, giving rise to a pressure on the optic nerve passing through the optic foramen, or else an actual perforation at this point into the cranial cavity beneath the dura mater, probably the former. Advised an immediate opening of the right sphenoidal sinus, to give drainage and relieve the pressure in the left sinus, as the danger of permanent blindness or of fatal meningitis was great should this relief not be quickly afforded. Dr. Brown concurred in the diagnosis and proposed treatment, and asked me to assume charge of the nasal and sinus part of the case. Dr. Elsner was asked to see the patient with us, and also concurred.

The patient was extremely nervous, constantly and involuntarily catching at my hand during this examination, and Dr. Brown, who had seen a good deal of her during the past two months, assured me that it would be practically impossible to do any operation under cocaine, and that a general anæsthetic would have to be employed. I felt, however, that her assistance and cooperation were essential, and two hours later, under cocaine anæsthesia, and, to prevent hemorrhage as far as possible, the application of a 10 % solution of suprarenal extract, the **operation** was done. Owing to the deflection of the septum, and the lack of control of the patient, the electric trephine could not be used with any degree of safety. The anterior end of the middle turbinate was first removed by Hartmann's conchotome, Grünwald's forceps, and the snare. The deviation of the septum and the free flow of blood, which the suprarenal only slightly controlled, made this exceedingly difficult. Bryan's chisel and curette were used to enter the posterior ethmoidal cells, and, having gone through these, continued until the sphenoidal sinus was entered. It was impossible to see much during the latter part of the operation, because of the free flow of blood and the increasing disquiet of the patient. The chisel, which was used both to enter the sinuses and to press over the septum, was kept well to the middle line and entered the sphenoidal cavity 2¾ inches from the lower margin of the nostril. As it could not be seen, I satisfied myself with the probe that it was entered and desisted from going farther; the opening made was then enlarged. A little pus was found on opening into the posterior ethmoidal cells and later in the sphenoidal, but the hemorrhage was so profuse that not much was to be seen. In an hour the patient went home, and at 8 P.M. was resting quietly. The next day the discharge of pus was most profuse, the eye symptoms no better and no worse. Steam inhalations and hot Seiler's solution was being employed every two hours. From this on, all symptoms began to improve, perception for light increased, and she was able to distinguish objects seen at the outer corner of the eye. On November 8th, a week from the operation, she could count fingers held directly in front of the eye, and the nasal breathing was much improved. Dr. Brown's note: "Vision $\frac{20}{100}$, disc less woolly and more distinct, vision improved, field better." Pus was coming freely from the right side of the nose, none from the left. In the naso-pharynx it was mostly from the right side. Two weeks from the time of the first operation I removed the remaining part of the middle turbinate and was able to probe and syringe the sphenoidal sinus. There was steady though slow improvement in the sight. On November 27th, pus in the right middle meatus being copious, antrum dark under transillumination, I opened into the antrum through the socket of the first molar which was extracted for the purpose. It was found full of pus of the odor of hydrogen sulphide. This was washed out, the cavity packed with iodoform gauze and dressed daily for a week, after which time a Myles drainage tube was put in place. The discharge now almost entirely ceased from the nose. The antrum was, after this, syringed twice daily with a boric-acid solution, and gave her little trouble. On November 30th, Dr. Brown, who died a few weeks after this, made his last record of the eye condition : " Nerve still pale but more clean-cut edge. V $\frac{20}{70}$ +. Blood-vessels fuller."

On January 2, 1901, the nasal symptoms had almost entirely ceased, there being very little muco-purulent discharge into the naso-pharynx ; no odor, nasal breathing good, washing from the antrum clear, but is still wearing the tube. Opening into the sphenoidal sinus free and easily seen. No frontal headache, general health much better. Can read large type with left eye, pupil contracts much better than it did, still some exophthalmos. She now came under the care of Dr. F. W. Marlow for her eyes. His report at this date is : " R V, $\frac{6}{6}$; L V, $\frac{6}{24}$. Not improved by glasses. The pupil acts well, but sluggishly to light. Perimeter shows marked contraction of the field of vision, most marked in the lower half of the field. Colors are recognized, but the field for color is much contracted, especially at the inner and lower portion of the field, where it approaches the fixation point." At his suggestion, Dr. Stephenson applied the mild continuous current, 1½ milliamperes, the positive pole over the eye, the negative over the occiput. Strychnia, which she had been taking for some time, was continued.

March 27th.—After irregular treatment of electricity her vision was $\frac{6}{12}$ partly, the size of the field for both white and colors being not materially changed. The antrum appearing normal, the antrum tube was left out with a view to the sinus closing.

On May 17th, being six weeks since the removal of the antrum tube, the following condition was noted. No pus to be seen anywhere in the nose or naso-pharynx, though patient says there is in the morning a " dropping " in the throat. The openings into right sphenoidal sinus are still free and easily seen, and no bare bone is to be detected with the probe. The opening made through the alveolus into the sinus appears closed, but a very fine probe can be passed through it. She is entirely free from headache, a thing which she had never been free from in two years previously, and the insomnia of two years' duration has entirely disappeared. General health greatly improved, and a gain in weight from 108 to 125 pounds in the six months since first operation. One can detect, on close examination, that the left eye appears to be more prominent than the right. The pupil reacts well to light and much better than a month ago, though not normally. She can read ordinary type with the left eye, but has to make an effort. Dr. Marlow's report as to the eye at this date is: "L V, $\frac{6}{18}$; color vision normal; pupils equal, left responding actively to the light, apparently as well as the right when the eyes are exposed to the sky, but much less than the right to the ophthalmoscope light reflection in the dark room. The left eye is slightly prominent, this being chiefly evidenced by a more extensive exposure of the sclerotic between the lower margins of the cornea and the edge of the lower lid. Ocular movements apparently normal, but the cover test and also the Maddox rod both revealed a moderate degree of exophoria (4°) and R hyperphoria (1°). The ophthalmoscope shows marked uniform pallor of the disc and diminution of both arteries and veins, the veins being at least as much reduced in size as the arteries. In the right eye the veins and arteries have a relative size of 2 to 1; in the left eye of about 1½ to 1. There are no white lines along the blood-vessels, and the margins of the optic disc are clearly defined."

There are several interesting features in this case. The sudden occurrence of blindness in the left eye without previous apparent implication of the left sphenoidal cavity would make it appear that the septum between the two sides had but recently broken down, or else that the orifice of the right sinus had become suddenly entirely occluded and so caused retention in the left side which may have been diseased for some time. Either supposition would explain the sudden blindness due to bulging of the sinus wall against the optic nerve, causing blindness. Although the blindness and the discovery of the choked disc were practically simultaneous, at the same time optic neuritis might have existed for some time prior to the onset of the amaurosis, as blindness frequently supervenes suddenly or with great rapidity during the course of optic neuritis of long standing. There were, however, no ophthalmoscopic signs that the neuritis had been of long duration, and besides this was the fact of the prompt improvement in vision following the evacuation of the pus and relief of pressure. There were also signs of a recent change in sinus conditions, viz., a sudden diminution in the discharge from the right side coincident with the amaurosis, and the appearance of pus in the left nasal cavity. These facts all seem to point to the supposition that the blindness and swelling of the optic disc were due to pressure of accumulated pus in the sphenoidal cavity upon the optic nerve passing through the optic foramen.

It would be interesting to know in which sinus the disease began, whether in the antrum, the ethmoidal, or sphenoidal. There is a history of frontal headache, insomnia, and post-nasal discharge existing for at least eighteen months prior to the occurrence of the signs of acute suppuration of the antrum, and I am inclined to think the ethmoidal and sphenoidal disease antedated that of the antrum. I have no doubt but that the deviation of the septum, interfering with nasal breathing and sinus ventilation, had a great deal to do with the causation of the sinusitis in the beginning.

While I have opened into the sphenoidal sinus many times, this was the first time I felt the necessity of opening into it at the first operation, ordinarily removing the middle turbinate and entering the posterior ethmoid and later the sphenoid. In this case it seemed imperative to lose no time in relieving the pressure, as permanent blindness or the patient's death might result from any delay. The deviated septum and the patient's excessive lack of self-control made the operation doubly difficult and extra hazardous. It would have been a much simpler matter to have opened into the left sphenoidal sinus instead of the right because of the deviation of the septum, and I am aware that had the case terminated badly some criticism might have been made for not having done this. The objections to it were that the doing of it meant the removal of a perfectly healthy middle turbinate, the wounding of the ethmoid, and the probable subsequent necrosis of this normal structure. Whereas, by operating on the side from which the disease had its origin, I hoped to cure or improve the ethmoidal necrosis which existed, as well as the sphenoid, and by giving good drainage to this relieve the pressure of the pus in the left cavity, and the subsequent history of the case appears to have borne out the wisdom of this course.

A CASE OF TUBERCULOSIS OF THE EAR, WITH AUTOPSY.

By HENRY L. SWAIN, M.D., New Haven, Conn.

TUBERCULOSIS of the ear is not so frequent a disease in adults as to make a single case entirely without interest. The peculiar features of the present case render it somewhat more remarkable, and so I have ventured to present the details of the history and relation of the pathological findings as briefly as possible.

Mr. S., thirty-seven years old, consulted me for the first time on July 15th, with a history of discharge from the left ear for six months past. The patient believed himself to have taken cold at this time, and since then the ear had continued to discharge profusely. Latterly he had begun to have considerable pain in the ear, and also in the whole of that side of the head. Inquiry developed that he had had a cough for a year and a half of varying severity, accompanied by three separate attacks of hemorrhage from the lungs at periods of about six months. The last attack was at the beginning of the present year just previous to the ear trouble. The physical examination revealed the patient to be in the advanced stages of a general phthisis, and although his nutrition was not bad he was extremely short of breath. His lungs developed a pronounced cavity in the upper part of the right, with indications of further disease in both. He was entirely deaf on that side, but heard the tuning-fork on mastoid in the other ear. The external ear stood a trifle farther from the head than the other, and there was a slight redness and tenderness over the mastoid region. The external canal was in a very irritated and inflamed condition, apparently due to the iodoform gauze which was packed down into the middle ear and canal so tightly as to effectually prevent any discharge from getting out. The middle ear, after the removal of the gauze, was poorly seen, owing to the narrowness of the canal caused by its swollen walls, but one easily made out a large accumulation of cheesy pus and granulation tissue. A large amount of this matter was scraped out, the patient was told to cleanse the ear thoroughly, using no packing, the expectation being that with free exit to the pus and less pressure from the packing the pain would cease. This latter seemed to be the only indication which we were called upon to meet, for at best the lease of life of the patient was short. We believed in temporizing, notwithstanding the fact that the affection of the ear must be considered as most grave owing to the probable involvement of the inner ear, and to the presence of carious bone discovered as we probed the middle ear.

I saw no more of the patient until July 25th, when I was called to take care of him in the hospital, to which he had voluntarily gone. He reported some lessening of the pain by the treatment which had been given him, but his head and ear again pained him, at times worse than ever, and he was unable to sleep nights from the pain in his head, which never seemed to be quite relieved. He confided to me at this time that he had had discharge from the left testicle for a long time, and that the right was also much swollen and very hard. He first noticed the trouble in the left about five years previous, and it had been discharging more or less ever since. Examination showed it to be discharging freely and the mass soft, while the right was twice the normal size and quite firm. A discharging sinus existed also in it. A more thorough examination of the lungs was then given than at the first interview, which revealed a large cavity in right apex, and the probable existence of smaller nodules distributed all through both lungs. The right lung was diseased down to the lowest part. His sputum and discharge from both the ears and testicles revealed tubercle bacilli. The afternoon temperature was on the first day 100.5°. The ear was externally about the same as before, but a much more satisfactory view of the middle ear could be obtained, and from it we learned that the granulation tissue was in a very thin layer over the promontory wall, and through it bare, hard bone could be felt throughout the entire middle ear, and externally into the canal beyond the annulus. The attic contained some cheesy masses and granulation tissue. With the pain on the vertex becoming daily more severe, and the certainty that the roof of the tympanum was carious if not sequestered, there seemed nothing to be expected but general meningitis and the exitus letalis. To operate and remove sequestered bone seemed unwise, especially in view of the large masses which are known to form in this class of cases. Indeed, it seemed quite doubtful if we could remove very much of the mass, which showed no signs of being loose, and the part which would be accessible for removal was the least offensive, hence it was deemed wisest to temporize, and by doing a simple scraping with the curette give every possible exit to the pus. This was done, and a large amount of carious material, granulation tissue, and necrosed bone removed from the attic, with the result that in a few days the patient felt partially relieved, and constant care and cleansing kept him fairly comfortable until his death, which occurred from inanition on September 12th. During the whole month he had pain enough to keep him restless and wakeful, although of course some of his uneasiness arose from his other troubles. There never was any meningeal complication.

The **autopsy** revealed general tuberculosis of both lungs, the right being much more affected than the left. There were tubercular deposits in the right kidney, both testicles, and the spleen. On opening the skull there was nothing found abnormal except an enlargement of the petrous portion of the temporal bone. The meningeal membranes were all in order, and the brain showed nowhere any signs of tuberculosis. Corresponding to the elevation on the petrous bone was a marked depression on the surface of the brain, which area was in other respects perfectly healthy.

Regarding the petrous portion of the temporal bone, the anterior side over the part corresponding to the middle ear, as will be seen from the model, was markedly raised up to the extent of about ¼ of an inch over an area of ¾ by ⅓ of an inch, and as before stated sufficient pressure had been made by it to make a permanent dent into the brain substance. No tubercles were visible in the pia or dura mater of this region, nor on the surface of the swelling, unless we call the small round nodules which are apparent in the cast, by that name. In this raised area the bone substance is extremely thin and in some places practically wanting. The dura and periosteum were very considerably thickened, as if to put up a barrier to further progress of the disease, and a tough, fibrous mass they made. From the cross-section it will be seen that a very large mass of the bone, including the walls of the middle ear, the cochlea, external canal, and part of the mastoid region, had become diseased and wellnigh sequestered. This bony mass is hard and flint-like in its feel as touched with probe, exactly as it was during the life of the patient. The auditory nerve is softened from the cochlea out to its exit into the interior of the skull, showing one of the paths which infection may take. Sections for microscopical study have been made in the decalcified tissue from the roof of the tympanum and in some of the more healthy bone. Those from the roof of the tympanum show tubercle bacilli in the coagulation necrosis areas but not in the advancing areas of the process, as is usually the case. The bone proper presented the appearance of melting away, like an iceberg breaking off bit by bit. Huge osteoclasts seemed to be the active agents in this destruction.

In only a few places in this diseased area was the bone separated into a complete sequestrum from the healthy bone. Indeed it would have been hard to find perfectly healthy bone-tissue in any portion of the main part of the petrous bone. The specimen also shows how the very large sequestra, which are reported from time to time as being removed in cases of tuberculosis of younger people, are formed. It also demonstrates how very futile would have been any surgical attempt to remove the mass in this case even if the general condition had been such as to warrant it. Indeed, as I have urged on a former occasion, too much manipulation in the attic of such an ear as this, unless done under the best surgical conditions, namely, detachment of the external ear from behind and pulling it forward so as to completely reveal and lay bare the middle ear, might easily have broken down nature's own barrier and precipitated the fatal issue of the illness by opening up avenues of infection which would eventuate in a meningitis. That the condition could have been so serious and threatening that an attack of meningitis was daily expected in the latter part of July, and yet the patient died six weeks later from other causes, shows in no uncertain way the effectiveness of the fibrous tissue in resisting the advance of the disease.

It is interesting further to comment that this case is an example of a general infection (probably beginning in the testicles), which might have been aborted by early surgery, and it also shows, when a tuberculosis originates in places other than the lungs and becomes general, how widely it is disseminated throughout the entire system.

For assistance in the pathological study I have to thank Prof. Charles J. Bartlett.

REPORT OF THE MEETING OF THE NEW YORK OTOLOGICAL SOCIETY OF MARCH 26, 1901.

By Dr. H. A. ALDERTON, Secretary.

VICE-PRESIDENT, DR. J. B. EMERSON, IN THE CHAIR.

Dr. James F. McKernon presented a case of **temporo-sphenoidal abscess—operation—cured.**

A. M., age twenty years, native of United States, was seen in consultation February 7, 1901. Upon examination, a profuse discharge of pus was found coming from the external auditory meatus of the left ear. She was unconscious and moaning. Temperature 97.4°, pulse 42, respiration normal. Diagnosis of brain abscess was made, and she was operated upon the following morning. The usual mastoid incision was done, and the mastoid found hard and dense as ivory, the pneumatic spaces being filled with firm bone tissue. Incision in the soft parts was carried forward over the left temple, and the parts retracted. The bone directly over the attic was removed by means of the chisel and rongeur, and a perforation found through tegmen tympani reaching upward into the temporo-sphenoidal region. There was a large collection of pus between the dura and the bone. This pus was very foul in character, and upon being cleared away showed a dura markedly thickened, dark in color, and roughened like a piece of leather. Considerable bone was removed above the original opening and in front, so as to expose all of that portion of the dura that was changed in color. The field of operation was then irrigated with bichloride, 1 to 4000, followed by irrigation with absolute alcohol. The dura was then incised with a scalpel sufficiently to admit the entrance of the index finger. The index finger was introduced into the opening and passed upward and inward toward the temporo-sphenoidal region, and upon being withdrawn was followed by discharge of pus, broken-down brain substance, and debris; the opening in dura enlarged still further, and the finger introduced and swept around the abscess cavity. The cavity was then irrigated with a saline solution, and packed with equal parts of iodoform and boric acid; gauze wicks made of plain sterilized gauze, moistened with bichloride solution, 1 to 4000, and rolled in equal parts of iodoform and boric acid, were then inserted into the abscess cavity. The cavity was not packed tightly, but loosely, the usual dressing was applied, and the patient taken to her room. For twenty-four hours after the operation the temperature did not go beyond 99.2° F. Pulse was never higher than 64. Patient regained consciousness, talked quite freely, said she was free from pain, and the only abnormal symptom that could be noticed was the presence occasionally of aphasia.

The first dressing was removed at the end of forty-eight hours. Considerable pus and more broken-down brain substance came away. The cavity was again irrigated with hot saline solution, and packed in the manner above described. This dressing was left in for three days, at the end of which time it was removed, and a smaller quantity of pus and broken-down brain substance was found. Upon the third dressing, rubber drainage tubes were used instead of the gauze wicks. At the end of twenty-four hours following, the patient complained of chilly sensations, vomited, temperature rose to 103.4°, pulse to 110, and within four hours after, a subnormal temperature was present, pulse of 54, normal respirations, patient still vomiting. The dressings were removed, and a large collection of pus was found in the abscess cavity, showing that the rubber drainage tubes had not performed their work. The cavity was again irrigated with a hot saline solution, and packed as at first with the wicks rolled in iodoform and boric acid. The case was dressed every forty-eight hours for the next two weeks, at the end of which time the patient was sitting up, and went on to rapid convalescence. At each dressing a smaller quantity of the wick was placed in so as to allow of a collapse of the abscess walls. The patient was discharged twenty-eight days after the operation.

Upon examination of the pus from the external auditory canal, the epidural pus, and that found within the abscess cavity, the predominating infection proved to be that of the streptococcus. In the last few dressings no irrigation was used, as there was no pus present in the cavity. At the present time the abscess cavity is about 1¾ inches in depth, and admits a piece of gauze wick about the size of one's little finger. The hearing on that side, while much below par, is rapidly improving.

Discussion.—Dr. HEPBURN asked how much hearing existed in that ear. Dr. J. F. MCKERNON : Hears speech about three feet, but hearing is improving. Dr. J. L. ADAMS : No aphasia before operation ? Dr. J. F. MCKERNON : History of none. Dr. WHITING stated that every case of brain abscess he had seen that had been irrigated had died. Of course, Macewen irrigates. Was a radical operation done on the middle ear ? Dr. J. F. MCKERNON : Yes. Dr. GRUENING : His experience with irrigation has been similar to Dr. Whiting's. Dr. EMERSON : What is the objection to irrigation ? Dr. GRUENING : Possibility of causing extension of infection. Dr. J. L. ADAMS : Has had one case recover in which irrigation was done. Dr. BACON : Has irrigated with poor results in cases complicated by lethal conditions, but thinks it possible that gentle irrigation may be safely indulged in, in cases not so complicated. Attributes bad results to the complications and not to the use of irrigation. Dr. COWEN : Any eye symptoms ? Dr. J. F. MCKERNON : Does n't know whether there was previous to operation. Has had success in three cases with gentle irrigation where there was purulent discharge or necrotic tissue. Strongly objects to drainage tubes, while he attains good results with wicks, which act as siphons.

Dr. E. GRUENING presented a case of **sinus thrombosis with ligation of jugular.**

In this case a cerebral hernia had developed after an extensive operation upon the mastoid. The patient, who had been presented to the Society last year, was again presented to show the action of contractile collodion upon the encephalocele. At the first demonstration the hernia was the size of a crab-apple. It has now diminished very much under the continuous pressure exerted by the contractile collodion.

Discussion.—Dr. WHITING spoke in favor of drawing together incision, in ligating jugular, by adhesive straps rather than by sutures. Very successful in preventing much deformity. Dr. DENCH spoke in favor of dressing simply as an open wound. Dr. BERENS had same experience.

Dr. TOEPLITZ presented his final model of **tonsillotome.** Has increased strength of blade.

Dr. J. L. ADAMS reported a case **simulating mastoid abscess.**

Discussion.—Dr. WHITING asked as to condition of fundus of the ear. Dr. ADAMS: Bulging of posterior wall prevented a view of the membrane. Dr. BACON asked whether it might not have been a case of grip, the pneumonia occurring as a complication of acute purulent otitis media and acute mastoiditis, and both due to the presence of the pneumococcus. Dr. Adams: Probably not. Dr. ADAMS thought the hot applications might have influenced the swelling.

Dr. SHEPPARD reported a case of **spasmodic stricture of Steno's duct,** due apparently to a catarrhal inflammation of its mucosa.

Mrs. T., aged seventy, has been seen with two attacks, each lasting three or four days, with six or eight months' interval, during which the parotid would rapidly swell at the beginning of each meal, and at least two hours would elapse before the entire subsidence of the swelling. The appearance of the swelling was attended with a very considerable amount of pain, similar to that caused by acids during an ordinary attack of mumps. In this case a small quantity of slightly milky-looking fluid could be pressed out of the duct by running the finger along its course toward the outlet. Each attack was seemingly promptly cured by passing a small-sized Eustachian bougie (celluloid) through the duct, and painting the course of the duct with tincture of iodine, only one such treatment being necessary.

Dr. J. E. SHEPPARD reported a case of **enlarged parotid gland.**

Mr. D., age forty-eight, had mumps in 1883. From then until 1888 recurring enlargement of left parotid gland, lasting only a few days at a time. Since 1888, gland constantly enlarged; so much so as to be plainly visible to the casual observer, the enlargement involving apparently the whole gland, but especially the lower half of it. Patient says that it serves the purpose of a barometer, always enlarging appreciably with the approach of a storm. About the only symptom of which the patient complains, aside from the enlargement, is a slight stinging pain through the gland, of short duration, accompanying the first mouthful of food, the rest of the meal being eaten without discomfort. A small celluloid Eustachian bougie can easily be passed through Steno's duct, and down posteriorly to the lower border of the parotid, a distance of 3½ inches. Treatment has consisted of the passage of such a bougie once in five or six days, the painting of the inside of the cheek with tincture of iodine, the surface being previously anæsthetized with 4 % solution of cocaine, and daily massage of the whole gland externally, but thus far without material improvement.

Discussion.—Dr. DENCH asked whether it was possible that it was a neoplasm. Possibly an enchondroma. Dr. SHEPPARD: Would an enchondroma grow larger and smaller? Dr. DENCH: That might be a matter of an intercurrent disturbance in secretion. Dr. SHEPPARD: It certainly grows larger and smaller. Dr. BEHRENS has seen three cases similar to those narrated. Recovered by use of the bougie. In one case the attacks seemed to coincide with attacks of rheumatoid arthritis. Alkaline treatment helped. Dr. TOEPLITZ: No calculus? Dr. SHEPPARD: None apparently. Dr. QUINLAN had a case of paroxysmal enlargement of parotid gland, coinciding with attacks of tonsillitis; would remain distended for one month. Dr. DENCH: Has the gland increased in size during the past six or eight years? Dr. SHEPPARD: Apparently not.

Dr. SHEPPARD reported a case of **sinus thrombosis, with temperature chart.**

Dr. GRUENING reported a case of an **excessive enlargement of the lingual tonsil.**

The patient, a girl of thirteen years, presented a growth of walnut-size, originating at the base of the tongue. It was first noticed when the child was about five years of age, and had been growing ever since, until it interfered with respiration, articulation, and deglutition. The mass was removed with an ordinary tonsillotome. Bleeding was easily controlled by digital compression. The microscopic examination showed that the growth consisted of adenoid tissue.

Discussion.—Dr. GRUENING asked how often adenoids of tongue occur. Dr. BERENS: Thinks they occur in about 25 % of those cases affected with adenoids and faucial tonsils. The removal of these growths in singers is very apt to influence the voice advantageously. Dr. QUINLAN: Rare in children, a condition of adolescence. Regards Dr. Gruening's case as a very exceptional one. Thinks they are due in many instances to compensatory hypertrophy; probably due to mouth-breathing. Excision with the knife is very dangerous, from hemorrhage. Believes in the cold wire snare, used steadily and slowly. Does not believe in the galvano-cautery snare, because of the danger of the formation of senechiæ, to the epiglottis. Recurrence is apt to take place if the other lymphoid hypertrophies are not removed from vault and fauces, and the patency of the nose must be established as soon as possible. Dr. TOEPLITZ thinks they are not so rare in children. He has not seen them much, but believes that this oversight is due to the use of the laryngeal mirror, in examination of children for lingual tonsil, instead of palpation. Dr. BERENS found them present frequently in cases of adenoids.

Dr. J. F. MCKERNON related history of a case of **temporo-sphenoidal abscess** in a boy.

A. T., boy, aged seven years, was brought to my clinic at the New York Post-Graduate School and Hospital, February 11, 1901.

Physical examination disclosed a purulent discharge coming from the left external auditory meatus. There was a boggy swelling behind the ear in the mastoid region, and an œdematous condition extending upward and forward over the left temple. In the centre of this boggy swelling was a scar showing where an incision had been made at some time previous. The history given was that at two years of age the child had contracted scarlet fever, and since that time the ear had been discharging. Eleven months before coming under observation the child had had a severe earache with swelling back of the ear, and this swelling had been incised by the physician in charge at that time, evacuating quite a quantity of pus, so the mother stated. The child had been vomiting, had been dull and listless, no appetite, complaining of intense pain on that side of the head for a week prior to observation ; temperature was 99.6, pulse 94, respirations 28, and operation was advised and accepted. Usual mastoid incision was made, and a quantity of sub-periosteal pus evacuated. Upon opening the mastoid, pus was found throughout. The necrosis principally extended upward and forward, involving the superior and lateral portion of the posterior wall of the bony canal. The incision in the soft parts was extended forward over the temporal region of that side, flaps retracted, and soft bone found at several points, through which pus was exuding ; a large sequestrum was removed, involving the roof of the tympanum and superior portion of the bony canal. The removal of this dead bone left an exposure of the facial nerve at two points. The removal of the dead bone was continued upward, and the dura found markedly darker in color than normal. Incision was made in the dura, and a grooved director passed upward and inward ; upon being withdrawn it was not followed by any flow of pus. Through feeling sure, from the discoloration of the dura and brain directly beneath it, that pus existed farther back, the opening was enlarged sufficiently to admit the passage of the index finger, and the finger passed upward and inward for about 2½ in., where it encountered a softened area in the brain substance, and, upon withdrawing the finger, about 4 drs. of pus and broken-down brain substance came away. The cavity was irrigated with a hot saline solution, and drained with wicks rolled in iodoform and boric acid, as in the former case.

The patient was returned to the ward in good condition, and from this time on made an uneventful recovery. At no time during convalescence was the temperature over 100°, and at no time was it subnormal. The abscess cavity was dressed every forty-eight hours, irrigation with a saline being used while any discharge of pus was present. As soon as the pus ceased, the cavity was no longer irrigated, but simply packed with the gauze wicks. The case was discharged from the hospital nineteen days after operation, and at the present writing the abscess cavity has entirely healed, only a firm cicatrix existing to show where the opening in the dura was made. The patient's mental condition is normal, and, save for a slight facial paralysis on that side, he seems to be in as good condition, his people say, as at any time during his previous life.

I wish to call attention in this case to the incision which was made eleven months prior to coming under observation, and the evacuation of the pus in the soft tissue. Had there been at that time a free exposure and opening of the mastoid, I do not believe this case ever would have reached the stage in which it was found, since, when it is thought necessary to do a Wilde's incision, it is certainly necessary to go still farther and open the mastoid, and relieve the patient of the danger of subsequent intracranial involvement.

Discussion.— Dr. GRUENING thought the good result might be due to the low position of the incision in the brain, which promoted natural drainage. Dr. DENCH thought drainage tubes did not always do harm. He had cases recover in which he had used them. Dr. GRUENING spoke favorably of inclosing the gauze drain in rubber tissue. Dr. EMERSON thought Dr. McKernon's method of drainage sounded very plausible, for good results. It acted by capillary attraction.

Dr. Dench reported a case of **mastoiditis recently operated upon,** in which, although the aural trouble had only existed for about a week before the operation, the mastoid cells were found to be much broken down. In view of the extensive destruction often found early in the disease, Dr. Dench advised that operative interference be instituted very early in these cases. He was of the opinion that the use of abortive treatment was a mistake in many cases.

Discussion.— Dr. Gruening believes in waiting a reasonable time to confirm the diagnosis, otherwise we might operate unnecessarily. And, in doubtful cases, of doing the operation as an exploratory procedure. Dr. Adams reported a case similar to Dr. Dench's case. Dr. Sheppard spoke of the significance of swelling of posterior-superior osseous canal wall close to the drum membrane. Believes this forms reason enough for operating.

Dr. Quinlan reported a case of **peculiar tinnitus.**

Male, aged thirty-eight years, had for four or five years become a sufferer from tinnitus after retiring in the evening, or would have attacks if he lay down during the day. The condition was generally ushered in by a paroxysm of cough and was always unilateral; that is to say, it was heard in the right ear. Careful examination failed to elicit marked changes in audition; there were occasionally vertiginous symptoms. A laryngoscopic view showed no abnormality except a large pediculated tuft of lingual lymphoid overhanging the epiglottis on the right side. This was removed by the snare, and the tinnitus has not returned.

Dr. Hepburn also reported a case of **tinnitus.**

Had grippe a week or two previously, then tinnitus in the left ear; no pain or other discomfort, but deafness and tinnitus only. Inspection showed muco-purulent secretion in contact with tympanum at inner end of canal and small round perforation in anterior inferior quadrant of the membrana tympani. Cleansing removed discharge, and hearing came up to $\frac{14}{40}$, and tinnitus ceased.

. . . .

Present: Drs. Gruening, Emerson, Marple, Cowen, Clemens, Berens, Hepburn, Quinlan, Whiting, Duane, Sheppard, J. L. Adams, McKernon, Toeplitz, Bacon, Dench, Lewis, and Alderton.

REPORT ON THE TRANSACTIONS OF THE SECTION ON OTOLOGY, AT THE NEW YORK ACADEMY OF MEDICINE.

STATED MEETING, HELD MARCH 13, 1901.

President JAMES F. McKERNON, M.D., in the chair.

(The evening was devoted to the demonstration or description of two electrical instruments as aids to hearing.)

NORTON L. WILSON, M.D.—It was my pleasure a few weeks ago to meet Mr. Hutchinson, at which time he demonstrated to me the usefulness of the Akouphone, and, at a subsequent meeting, the practicability and usefulness of the Akoulalion, an instrument for the instruction of deaf-mutes. Dr. Chambers and myself made practical experiments with these instruments and we are satisfied that they are of merit, and we believe that any instrument of this kind ought to be presented to the medical profession. Therefore, I took the liberty of inviting Mr. Hutchinson to appear before this section of otologists in order to give them an opportunity of examining these instruments. I take pleasure, therefore, in introducing to you Mr. Hutchinson, an electrical engineer of this city.

M. R. HUTCHINSON.—In treating the subject of deafness from the standpoint of a mechanic and engineer, I consider the ear merely as a piece of machinery, subdivided into its integral parts which individually perform certain functions when acting in normal conditions. For several centuries the attention of scientists has been turned toward the partial relief of deafness by the substitution of mechanical contrivances to perform the functions of the mechanical parts that have deteriorated.

In 1840, Marcus Banzer devised an arrangement consisting of an ivory tube over which was drawn a portion of a pig's bladder. This was introduced into the auditory canal. In 1763

Leischevin, in 1815 Autenrieth, and in 1840 Lincke used similar devices, more with the view of protecting the middle ear in perforations of the drumhead than for any auditory aid. In 1848 Dr. Yearsley, of London, found that little pellets of cotton introduced into the ear in many cases enabled the person to hear. Since that time there have been various disks devised, which possess merit for certain classes of deafness. The introduction of a foreign substance into the ear is a difficult undertaking in some cases, as it seems to be quite a hard matter to keep down suppuration. Possibly the most efficient and satisfactory aid to the ear was devised by Enoch Henry Currier, M.A., Principal for the New York Institute for the Instruction of the Deaf, commonly known as a Currier Conversational Tube.

These contrivances have all been of use to a small per cent. of the partially deaf, but there has never before been devised an instrument that would enable those who were stone deaf, or those extremely hard of hearing, to hear to any satisfactory extent. Twenty per cent. of the deaf are not handled to a practical extent by instruments. They may be able to hear sound, but the ability to distinguish between sounds is lacking and they seem beyond hope. The remaining eighty per cent., if handled in a practical manner, can be reached successfully.

In speaking of this eighty per cent., I would divide them into three classes. First, deaf-mutes; secondly, extremely hard-of-hearing; and, thirdly, slightly hard-of-hearing persons.

To the first class belong congenital deaf-mutes, and also persons who are considered totally deaf but could once hear. With the former, although they hear the sound of words, having never before experienced this sensation, they are not able to understand what sound is, and it is a very laborious task at first to get them to distinguish between sounds. Also there is to be contended with the lack of desire on their part to hear, as, never having heard, they naturally do not appreciate what they are missing. This is possibly the hardest class to handle, and it is very rare that anything is ever done with this class after they have reached maturity. With children, however, the case is different. They are attending the magnificent institutions of our country where the most brilliant minds of the age are devoting their lives to the relief of the unfortunate conditions of these children. Their minds are in a receptive condition, and a course of instruction instituted in the regular curriculum of these schools, would enable a competent teacher to teach the children the meaning of sound, the difference between sounds, the sound of words connected with their meaning,—and being enabled to hear ***their own*** voices in repetition after the teacher, the children would naturally cultivate a normal tone and perfect articulation, whereas it is rare that a perfectly easy flow of words is accomplished with present systems.

I consider it marvellous that so much has been and is being accomplished in this direction, when it is considered that the pupil neither can hear the sound which he is trying to imitate, nor hear the sound of his own voice in repetition. Let it be thoroughly understood that although a deaf-mute has been thoroughly educated in lip-reading, and can speak himself, when he hears words spoken to him he does not know what they mean.

An analogous case would be that of a person who has always been blind. He knows a table, a book, or a chair by the sense of touch, but if such a person should suddenly receive his sight, he would become totally confused, and it would take a long time and much effort on his part to learn to correlate the image of the thing with the name of that object and have a thorough understanding of these two.[1]

Also, if persons who have been totally deaf for quite a length of time, not having heard the sound of articulate speech for so long a time, naturally forget what words, etc., sound like, and, although they have more of a foundation to build upon than that of the congenital deaf-mute, still it is a matter of practice before they become familiar again with sound, even when presented with such tremendous reinforcement and precise articulation as is accomplished by the Akouphone or the Akoulalion.

I know of many instances where persons that have been totally deaf for a number of years and have forgotten how to understand speech, have, by means of my instruments, again become familiar with words by having practised talking to themselves. In fact, this is the quickest and most satisfactory way of reaching such a case.

To this first classification belongs the Akoulalion, the name being derived from two Greek words, "Akou" to hear, and "Laleo" to speak, and which is intended to convey the idea that by hearing they are taught to speak correctly. This instrument consists of two instruments, known as the Pupil's Stand and the

---

[1] This is not based on fact. Children born blind from uncomplicated cataract, after successful operation, even as late as in their fifteenth year, learn how to see with amazing rapidity. H. K.

Teacher's Stand, respectively. The Pupil's Stand is provided with two ear-pieces, which are mounted on an electric spring, which clamps the ear-pieces against the ears. On each of these ear-pieces is mounted a pneumatic cushion, which may be removed, if desired, to correspond with the nature of the deafness, as explained later. On this base there are likewise mounted three vertical rods, upon which slides a small hard-rubber carriage, having mounted upon it the receiving instrument, into which the pupil speaks when he wishes to hear his own voice. Connected to the Pupil's Stand is the Teacher's outfit, which likewise has a round base, having mounted upon it a somewhat similar set of vertical rods having a small carriage supporting a similar receiving instrument. The height of the receiving instrument in both cases may be adjusted to conform to the height of the pupil or teacher when using the instrument. To the Teacher's outfit is attached the wire leading to the electric battery, which can be situated anywhere in close proximity to the instrument. The Pupil's Stand is likewise connected to the Teacher's Stand by a three-conductor flexible cord. The phonograph attachment is also connected with the Teacher's Stand. This latter attachment can be adjusted to any phonograph, gramophone, or other talking instrument. It is almost universally the case that one ear has slightly more hearing than the other, and for this reason it is necessary not only to adjust the amount of sound going to or being received by the ears of the deaf-mute, but also to regulate the intensity of the sound delivered to each individual ear. This is a vitally important thing, and alone places the Akoulalion far ahead of any similar device. In alternating instruction by simple, rhythmic music, an appreciation of music is cultivated along with that for articulate speech.

The question naturally arises, what will be the eventual outcome of the course of instruction with the Akoulalion? A person cannot use so large an instrument in the transaction of every-day affairs, and naturally must be able to use a smaller instrument, which can be carried around with him. I will answer this question by stating that the Akouphone, or a small portable instrument, can be made just as powerful as the Akoulalion, but the Akoulalion possesses many advantages in there being a tremendous increase in the articulation of the word and the application of the sound to both ears at once, and the ability of the pupil to hear and speak the words in immediate repetition after the teacher. So, after having learned the meaning of the sounds, such a person can provide himself with a small portable Akouphone, by means of which he can transact ordinary every-day intercourse. It is likewise a fact that the continued use of the Akoulalion has improved the hearing of quite a large per cent. of the deaf.

It is but natural to suppose that a function which is inactive, when exercised will naturally have a tendency to awaken and perform its natural function more efficiently, provided there is not some destruction of the nerve itself.

I have known many instances of persons being able to hear perfectly with the Akouphone or the Akoulalion who had no appreciation whatever of sound by the ordinary tuning-fork or the shrill Galton whistle. Why this is I do not know, but it is true. I am led to believe, by a very extensive series of experiments with this instrument, that the destruction of the auditory nerve is the only thing that will prevent sound from becoming intelligible. Likewise, persons who, by the tuning-fork tests, have an appreciation of certain notes and a lack of appreciation for lower or higher notes, hear all notes alike with the Akoulalion. Why this is I am likewise at a loss to understand.

The Akoulalion is at its maximum efficiency when in the hands of a competent instructor of the deaf, as he understands the individual handling and instruction of the deaf better than almost anyone else. But the Akoulalion can be used in the private home for the instruction of children during vacation, on lines mapped out by competent teachers.

The second classification consists of those extremely-hard-of-hearing. A person who has been very deaf for quite a while has forgotten how to eliminate the sounds that he does not wish to hear. For instance, when using the Akouphone, which intensifies the sounds tremendously, if three or four people talk in close proximity to the one who is addressing the deaf person, the latter hears a general confusion of sounds, and he is unable to eliminate the sound of the other persons and to concentrate his attention upon what is said by the person who is speaking to him.

Hence, for this class of deafness, the type C instrument is designed, which enables the deaf person to hear *only* what is said by the person addressing him. Also two or more individuals may be present, each with a receiving instrument, into which each member of the company present speaks, and the deaf person can not only hear what each person says to him, but he can likewise hear the remarks of one of the persons to the other.

This instrument gives a perfectly clear enunciation, and it is a pleasure, not only for the person speaking to be able to talk in a very low tone of voice, and have everything distinctly heard by the deaf person, but it is likewise a pleasure for the deaf person to be able again to enter conversation.

The little receiving instruments are made of aluminum, are always clean and sanitary, and do not retain obnoxious breathing odors. Furthermore, the lower a person speaks, the louder the akouphone delivers the sound to the deaf person. If the receiving instrument is shouted into, the excess of sound is entirely cut off, so that the deaf person is not inconvenienced in the least by having to ask the person to speak in a lower tone of voice, and no detrimental effect is possible upon the ear. There is a little black flexible cord running to each one of the receiving instruments. The deaf person has a small ear-piece about the size of a watch, which is either held to the ear in the palm of the hand, mounted upon a handle, or by a head-band, which holds it in place without manual labor on the part of the deaf person.

The ear-piece can be regulated to suit the case of deafness and intensity of the sound, and is as necessary as it is to focus a field- or opera-glass to correspond to the eyesight of the observer and distance of the object.

A small, dry, pocket storage-battery supplies the necessary electricity to operate the instrument, and this can be readily recharged by the aid of the outfit furnished, without inconvenience or knowledge of electricity on the part of the patient.

After the deaf person has been using this style of instrument for some time, a normal condition is developed in that the hearing is accustomed to receiving sound which is applied to the outside. The use of any aural instrument, which protrudes into the ear, is not only a menace to the healthy condition of the ear, but likewise cultivates what might be termed "near-of-hearing." The same as would be the case if a person would habituate himself to holding a book within two or three inches of the eye when reading. He would become near-sighted. So the ear, having the sounds projected upon the auditory apparatus by a tube extending into the ear, becomes so accustomed to hearing sound delivered in this manner that it is in many cases difficult for them to understand at first with the Akouphone. The ear has to become accustomed again to hearing sound applied to the outside. In many cases this is the ultimate point that can be reached, but there is a tendency in many others for the hearing to be gradually developed to the extent of the person being able later to use an instrument which picks up surrounding sounds within a reasonable range, and transmits them to the ear of the person. Then, again, the person has to learn to eliminate not only the echo in a room or hall of bad acoustic properties, but also the sound of voices he does not wish to hear,—in other words, turn the sound into an intelligible state of affairs.

An analogous case is that of a telegraph operator, who is able to stand anywhere within hearing distance of a telegraph instrument and, in spite of the loud clicking of instruments even closer to him than that which he wishes to read, is able to eliminate the sound of those other instruments and hear only what is said by the instrument he is listening to. But if he leaves the telegraph office for a number of years and returns again, he is not able to do this at once. Not only that, but he is unable to follow any one instrument perfectly, for the reason that he has forgotten how to concentrate his attention on any one particular instrument. But after he has been in that office for some weeks, he can again accomplish the same results as before.

So it is with a deaf person. After having practised listening to one voice at a time, he is able eventually to hear many voices and to eliminate from the chaos of sound all except that which he wishes to hear. Hence it is but natural that many persons who expect immediately to hear with the Akouphone sounds which they once heard when having normal ears are disappointed. With perseverance on their part they will accomplish what they desire.

It has been asked for what kind of patients the Akouphone and Akoulalion are unsuitable as an aid to hearing. An answer is: Children under seven years of age, persons having paralyzed nerves, persons of hysterical temperaments, and people of extreme age.

Briefly stated, the Akouphone is a portable instrument which a large per cent. of the deaf can carry around with them, hear ordinary conversation, and can attend public meetings. This is not accomplished immediately, but the continued use of the instrument will gradually yield satisfactory results. We have an instrument exclusively for the desk of the business man, in which his batteries are being charged all the time when he is not using his instrument; for the dining-room table, so that the host can sit and listen to the general conversation going on around the table; for the library for similar use; and for the opera, theatre, or church we have the "Opera Outfit." In fact it supplies almost any demand that can be made upon an instrument for the deaf.

It has required the expenditure of thousands of dollars and many years of constant endeavor to place the instrument upon the high plane which it enjoys, and not until it was a thorough success would I allow it to be put before the public.

[After the reading of the paper a number of people more or less hard of hearing, invited not only by Mr. Hutchinson, but by members of the Section, were tried with the Akouphone and the Akoulalion. These experiments awakened a keen interest and not a little approval on the part of the aurists. The latter, however, regret, with the editor of these ARCHIVES, that reporters of two morning papers had found their way into the meeting room and furnished glowing accounts of the session to the lay press. The Otological Section of the New York Academy of Medicine is young and ambitious. The members are eager to acquaint themselves with everything that sounds like progress, but they do not forget the admonition of the apostle Paul: *Prove all things, hold fast that which is good.*—ED.]

STATED MEETING, APRIL 10, 1901.

JAS. F. MCKERNON, M.D., in the chair.

Presentation of specimen of tuberculosis of the ear, with history and autopsy of the case, by Dr. H. L. SWAIN, of New Haven. (Published in full in this number of the ARCH. OF OTOL., p. 230.)

Dr. M. D. LEDERMAN: In listening to the history of this case of advanced tuberculosis affecting the ear, the unusual feature of the course of the disease was the severe pain of which the patient complained.

As a rule, tuberculosis affecting the ear progresses insidiously, without painful manifestations, and the destruction of neighboring tissue is very extensive. It is advisable to examine the discharge bacteriologically in these cases of chronic suppurative otitis, and ascertain the sort of infection we are treating.

Dr. ROBT. C. MYLES: This remarkable case reminds me of one that I was called to see in consultation with a general surgeon and a specialist within the past year. The patient was a young girl who had been operated upon for tubercular cervical glands, several of which had been removed. This child had destructive changes beneath the skin of the entire mastoid, which was softened; there had been very little fever and practically no pain. The swelling was quite prominent, and there had been at times a slight discharge from the ear. The incision revealed a degenerative process of the whole mastoid and the membranes of the lateral sinus, with granulation tissue. I persuaded the surgeon not to extend the operation too far, and to leave some of the granulations. Some of the bone toward the torcular Herophili was removed. The argument that I used was that "he would break down nature's barrier if he extended the operation farther." The cavity was packed, the patient made an uninterrupted recovery, and is well to-day. The history of the case was remarkable in that there was no fever, and the other symptoms were different from those usually observed in mastoid cases.

Dr. JAS. F. MCKERNON: I should like to say a few words to corroborate the statements made by Dr. Lederman and Dr. Swain. During the past year and a half I have had under observation two cases of tuberculosis of the mastoid, and in one of these there was an entire absence of pain throughout all this period of observation. In one of these cases a radical operation was done upon the mastoid, and the diseased mastoid has not healed yet. In regard to what Dr. Swain says of the breaking down of nature's barrier being an unwise procedure, I agree; but we do not expect to have acute exacerbation of the disease following the use of this surgical measure, when pus is present. I think in tuberculosis of the tympanum without any involvement of the mastoid structures, that simply removing the granulations and dead bone through the external auditory canal will aid greatly. But I am opposed to doing a radical operation in these cases, especially when systemic infection is present.

Dr. H. L. SWAIN: I am glad that the gentleman called attention to the fact that there was so little pain in tuberculous cases, as I wished to emphasize its presence in this case as being unusual.

Tinnitus aurium; some remarks on its causes and treatment.

Dr. THOMAS J. HARRIS, in his paper, referred to the brilliant results that had been accomplished in many branches of otology, and deplored the slow progress that had been made in the treatment of tinnitus. Reference was made to the limited literature on the subject, Politzer and Urbantschitsch being mentioned as the largest contributors, and of recent literature the important article by Panse.

Frequency and Classification.—In 824 cases of ear trouble observed by the writer, 321 of tinnitus were recorded. Emphasis was laid on the importance of proper classification. All cases of tinnitus are due to one or two generic causes, either of some lesion or interference with the function of the sound-receiving apparatus, or some lesion, or other causes, interfering with the sound-conducting apparatus. To the first is given the name *subjective tinnitus*, to the second, *entotic tinnitus*. There is still a third class, called *objective tinnitus*.

Etiology.—Attention was directed to the important rôle played by obstruction to the transmission of sound, whether located in the middle ear, Eustachian tube, or auditory canal, as the causative factor in producing tinnitus. Tinnitus is sometimes met with in persons of normal hearing—*reflex* or *objective tinnitus*. Here muscular spasms of one of the muscles in or adjacent to the ear is the cause. Pressure on the blood-vessels adjacent to the ear may produce a like result.

Diagnosis.—In the diagnosis of tinnitus, a careful examination of the condition of the drum membrane, Eustachian tube, nose, and throat was urged, and especially that the pitch of the noise be obtained by means of the tuning-fork. This, in entotic tinnitus, will be low, c, c′ or c″.

Prognosis.—The prognosis was not regarded so bad as was generally supposed, especially if the condition was dependent upon an obstruction of the sound-conducting apparatus.

Treatment.—The treatment is intimately associated with the differential diagnosis. Much can be done by attention to the nose and throat. The value of establishing the patency of the Eustachian tube was urged. The author employs, in addition to catheterization of the Eustachian tube, the celluloid bougie, and spoke with encouragement of electrical dilatation as recently recommended by Duel. Massage of the drum membrane will often be of value in releasing adhesions. The author's experience in the use of electricity was without success, in spite of the claims made by some reporters. Electrical massage of the drum membrane did not seem to sustain the claims put forward for it. The therapeutic treatment of tinnitus is unsatisfactory. The writer had found the best results with strychnin, iodide of potassium, and nitro-glycerine; less success with tincture of gelsemium, bromide of potassium, tincture of digitalis, hydrobromic acid, and conium, which had been used without avail. Finally reference was made to the benefit to be obtained in certain cases with suprarenal extract.

Discussion.—Dr. H. L. SWAIN.—I do not know that I have anything special to add to the statements made, but there are one or two points that occur to me. The reader of the paper did not refer to the use of pilocarpin in the treatment of these cases. It used to be the habit in the clinics in Germany, when they did not get good results from the treatment of the conducting apparatus as a routine practice, to place the patients on the electrical treatment and strychnin or pilocarpin injections. In the cases that had distinct involvement of the internal ear or the auditory nerve they used strychnin; where there was little or no involvement pilocarpin was used. They used to get a certain amount of encouragement from this practice. I have followed that plan since as a general rule. Electricity has proven beneficial in a large number of nervous cases, especially in those where there was immediate relief at the time of the electrical séance. The tinnitus is usually relieved by using the cathodal. Pilocarpin or strychnin, when used hypodermatically, was given under the skin of the mastoid, because it was the idea that absorption might occur directly into the lymphatics when introduced at that situation. I am sure that strychnin, when thus introduced hypodermatically, apparently did more good than when it was administered internally, or injected anywhere else. In the internal-ear cases, full physiological doses were given every other day, in ascending doses for a period covering six weeks, with two more of descending doses. If there was no relief at the end of a short time, the case was dropped. Such has been my habit and I get fair results.

As to the use of electricity and the length of time which the patient requires, we are obliged to conduct ourselves *pro re nata.* Some cases require as much as half an hour at a sitting. I do not believe that electricity has been thoroughly tried, under a period of six weeks.

The Doctor did not mention some of the operations done in Boston by Dr. Blake and Dr. Jack, loosening up the adhesions about the stapes; they were often done for the relief of the tinnitus as well as for the improvement in hearing. In many instances the tinnitus has been completely relieved, when the hearing was only slightly or not at all improved.

Dr. M. D. Lederman.—In reference to the previous speakers' remarks I would like to state that a few years ago I reported a case of labyrinthine deafness, following typhoid fever, which improved considerably under the internal administration of pilocarpin and strychnin in ascending doses. This young girl had been in an asylum for four or five years without any improvement, and after the above treatment for three or four months, she was able to hear loud tones sufficiently well to understand what was wanted of her.

In reference to the treatment of tinnitus aurium we see so many cases which have been treated before ; these cases go the rounds and, naturally, each aurist finds something new. In a number of cases of the neurotic variety the tinnitus aurium is increased by excitement, by noises, etc., and these patients are at times benefited by the internal use of hydrobromic acid. In a recent paper by Dr. Pritchard, of London, observations were made in cases of Ménière's disease ; two or three cases were cited where it was claimed that the tinnitus was improved by the use of this acid. It has been my custom in giving hydrobromic acid, to start with thirty drops three times a day and increase the dose to one drachm three times a day. Have tried black snakeroot which has been suggested and claims made that some benefit was obtained. In some cases the noises were lessened ; in others no relief was obtained.

In a number of instances considerable improvement has followed the treatment through the Eustachian tube of a solution of menthol, iodin, and benzoinol. A pressure, from ten to twenty pounds, is employed through the catheter. The catheter is filled with the solution and some is blown into the tube and middle ear. This treatment is carried out in the chronic variety of middle-ear catarrhal troubles, not in any acute exacerbation, or where there is any danger of infection. Have used this method of treatment regularly and have as yet never set up an *acute* otitis. Never attempt it in an acute case except with extreme gentleness. Lately a two per cent. solution of pilocarpin has been suggested to be applied through the catheter. This must be used with great care because pilocarpin decomposes rapidly unless rendered sterile. The use of the massage arrangement with graduated probe has been employed by Professor Lucae, of Berlin. Have tried this instrument, and must conclude that the German ear will stand more pressure than the American ear. The slightest probing causes excruciating pain. A treatment which has been tried, but without getting pronounced results, is the surgical procedure of making a small incision through the drum, posterior to the handle of the malleus, and making traction with a small hook around this ossicle.

Dr. ARTHUR B. DUEL.—I have found hydrobromic acid or bromide of sodium a most useful temporary remedy in cases of distressing tinnitus aurium. I have never been able to arrest tinnitus permanently by the use of any drug, but have had repeated successes, in cases where the tinnitus was due to Eustachian obstruction, by restoring the patency of the tube by the electrolytic bougie.

Although I have repeatedly tried the galvanic current over the mastoids for the relief of tinnitus, I have met with rather indifferent success so far as permanent cure is concerned. A very large percentage of all cases will have the tinnitus either greatly diminished or entirely stopped, temporarily, by one or the other pole of the galvanic current. I know of no rule for determining which pole to use in a given case, except to try the positive, then the negative, over both mastoids. I have found that the positive externally more frequently diminishes or stops the tinnitus, than the negative. Where the positive fails the negative will usually succeed. Where one pole diminishes or stops the tinnitus, the other almost invariably increases it.

In a few cases where the galvanic current has immediately stopped or greatly diminished the tinnitus temporarily, I have been able to give permanent relief by a long course of treatment at intervals of two or three days.

Dr. JAS. F. MCKERNON : I should like to say a word in reference to therapeutics. Dr. Harris mentioned the fact that Dr. Gomez used hyrobromate of conium in $\frac{1}{60}$ of a grain dose. At that time Dr. Gomez and I were in the same aural service, but I used it stronger, running it up from $\frac{1}{20}$ to $\frac{1}{10}$ grain doses three times a day in cases of marked tinnitus aurium not due to any obstruction of the Eustachian tube but to middle-ear causes. I began with doses of $\frac{1}{10}$ of a grain three times a day. I followed this plan of treatment up in twenty cases. In eight cases the tinnitus disappeared after being under observation for eight months. Five cases were very markedly improved and gave no further trouble. They reported at short intervals and then disappeared from observation. When the attacks came on they usually followed a full meal. In the seven remaining cases there was no improvement. I think this treatment saves much time in cases where there is no obstruction of the Eustachian tube or adherent ossicles. In a fair number of cases I have gotten temporary results with this drug in the dosage mentioned. I think one of the best drugs to use is iodide of potassium, particularly in those cases not of long standing and where there has been a serous exudate; this drug acts upon it in the same way that it does in the exudate in the pleural cavity. I have had fair success with pilocarpine but not when given in aqueous solution nor in children when going to school, as they take cold so readily during the sweating stage.

The patient should be placed in bed and the drug administered hypodermatically, commencing with $\frac{1}{8}$ of a grain, and it then should be run up to its physiological limit. Keep the patient in bed and keep on increasing the dose of the drug and at the end of six weeks you will know definitely whether you are helping your patient or not, as a trial over a shorter period of time will hardly prove the efficacy of this drug.

In reference to what Dr. Swain mentioned in regard to the separation of the stapedial adhesions for the relief of the tinnitus, I have seen a number of cases that have been operated upon by other aurists, and it does relieve the tinnitus temporarily. But all the cases under observation show that so soon as the adhesions re-form the tinnitus returns with the same amount of intensity and frequency as before. I have practically given up that procedure as a surgical means of relief.

One other point, and this is a ground of contention because it has been distinctly fought against. For the relief of the tinnitus, where the Eustachian tube is wide open, I introduce the negative pole of a galvanic current, passing it up into the middle ear behind the long process of the malleus, using a current of from thirty-five to forty volts, two and a half milliamperes, running it up to six or seven, and leaving it in contact for from four to ten minutes. In cases where there has never been any tightening or stenosis of the Eustachian tube, tinnitus has not only been helped but relieved permanently in a large proportion of cases, unless the patients take cold or contract an acute pharyngeal inflammation later. This particularly applies to old cases. If I am asked how it does it I cannot state whether it is due to a chemical action or to simply vasomotor stimulation. I am positive that it acts particularly well in cases over fifty years old, where the tinnitus is very distressing, and where the patients have not been able to obtain any previous relief. In these cases where there is relief, in a large proportion of them the relief has extended over a period of two and a half years, the length of time I have been using this method.

Dr. THOS. J. HARRIS: I am grateful for the open way this subject has been discussed. I brought it forward not with any idea of throwing new light upon the subject, but because I believed it was such a practical subject that something of value might be gained in stimulating us to the recording our results and comparing notes. We are not going to learn the value of any one drug by its use in one case, nor can we say that we have succeeded in the use of one drug because the patient says on the day following its use that he is better. We should test it by the permanent results. I have not intended to even attempt to give a résumé of the various remedies that have been used in the treatment of tinnitus aurium. It is quite interesting to think of the different results that have been obtained by different observers. I have tried hydrobromic acid and bromide of potassium in probably fifty cases, and I am confident that I never got any marked benefit from their use; yet equally good observers have obtained at least temporary beneficial effects. I have used these drugs until I got the full physiological effects, and yet the patients return to me and say that their noises are no better.

In reference to the treatment by pilocarpin, I tried it in a number of cases in Dr. Nichol's clinic, some at the office and some at the clinic, and we had a series of failures. I think these cases were kept under treatment at least two and probably three weeks with daily injections; the size of the dose was increased up to the time they obtained $\frac{1}{6}$ or $\frac{1}{4}$ of a grain, and in these cases I cannot say that we got any beneficial results.

I have had no experience with the use of strychnine hypodermatically although I think this is a most valuable drug.

I have had no experience with the use of electricity. At the Manhattan Eye and Ear Hospital, we formerly sent all our cases that had their tinnitus dependent upon nerve disease to the nerve department, and I can say that in those particular cases there were no beneficial results. I am gratified to hear to-night the good results obtained by the use of electricity. According to Jones, we cannot always stop with the use of the cathodal current;

he has been wont to make use of the anodal current as well. Jones says that if one cannot get beneficial results from the first treatment it is useless to continue the experiment.

I did not mention the work of Blake and Jack in breaking up adhesive bands; the results of this procedure are still *sub judice.* It does not promise enough.

Conium, as suggested by Gomez, I have tried in about half a dozen cases, beginning with $\frac{1}{60}$ of a grain and increasing the dose until the physiological effects are produced; giving just as much as the patient will stand. In my cases relief followed in one instance only.

In regard to the use of electricity, referred to by our Chairman, I have had no experience whatever.

Tympanic vertigo, due to obstruction of the Eustachian tube. By Dr. WM. P. BRANDEGEE.[1] Published in full in this issue, p. 205.

Discussion.—Dr. WILSON: I have had the privilege of seeing some of the cases reported by Dr. Brandegee, and should like to add my testimony as to the efficient treatment that was employed. At first I was somewhat skeptical concerning the improvement in these cases. Through the kindness of Dr. Brandegee I saw a number of cases and talked with them, and they all were delighted with the treatment. One man stated that he obtained such great relief from the first treatment that he could hardly wait until time for the next treatment. These remarks encouraged me, and I went home and experimented. I presume I have bougied the Eustachian tube about eighty or ninety times, and find the electric current a most efficient means for breaking down the strictures. If any one present has ever used electrolysis for breaking down the strictures, they can appreciate the feeling as the instrument comes against the stricture. I have also passed it through the lachrymal duct, and it passes there as easily as it does through the Eustachian tube. I have had enough of these cases to know that the treatment is one of great value, and shall continue using it. It does not cure every case of stenosis of the Eustachian tube, but it is the most efficient means of opening the tube.

Dr. WENDELL C. PHILLIPS: At the present time I do not feel inclined to discuss the treatment employed for the relief of this condition, but I rise to ask a few questions. At the same time I should like to call attention to one fact. The cases that

Dr. Brandegee reported were people who had constant vertigo, and not intermittent vertigo, and it strikes me that this is an exceedingly rare class of cases. It is more common to have present occasional vertigo. I should like to ask if all the cases had constant vertigo; also, if he has made any effort to relieve cases of Ménière's disease by this method of treatment. One might get the impression that all cases of vertigo are associated with stricture of the Eustachian tube; this, of course, is not true, for there must be a class of patients with vertigo who have no stricture of the Eustachian tube. I have such a case under my care, but it is not one of constant vertigo. She occasionally is compelled to give up her work and go to bed. In this case the Eustachian tubes have been repeatedly examined, by means of the otoscope, and found to be patulous. She also has a chronic catarrhal otitis media.

Dr. **Joseph A. Kenefick**: It seems to me that we cannot consider one symptom without considering the other. Cases of vertigo presenting themselves at the Eye and Ear Infirmary have been usually associated with tinnitus, and it has been my experience that, after the tympanum has been ventilated, the vertigo and tinnitus have disappeared. It seems to me that the great majority of these cases of vertigo and tinnitus might be classed under two headings: (1) Those which are dependent upon primary intralabyrinthine pressure, caused by obstruction within the Eustachian tube, and (2) those caused by contraction of the tensor tympani or of inflammatory bands within the tympanum. It is therefore evident that by restoring the patency of the Eustachian tube, and destroying these bands if they can be reached, these symptoms ought to be greatly relieved. I have had the pleasure of following the cases with Dr. Brandegee, and the relief obtained by some of the patients is considered by them little short of miraculous.

In regard to the method of reducing intralabyrinthian pressure by opening the Eustachian tube, I can only add my testimony, and say that I know of no method by which organized obstructions can be removed more easily than by the method of Dr. Duel.

Dr. **Arthur B. Duel**: I can subscribe most heartily to the statements that have been made by the previous speakers. Dr. Kenefick has just covered the ground in regard to the class of cases of tinnitus and vertigo which can be relieved by electrolysis of the Eustachian tube. I do not see how it would be possible to relieve a case of *true* Ménière's disease by the use of electrolysis in the Eustachian tube or tympanum.

I wish to call attention to the careful technique that Dr. Brandegee has adopted in doing this work, and to insist upon it that all others should follow it as carefully, if they hope for good results. Since I read a paper on this subject, three years ago, otologists throughout the country have employed this method of treatment, and some have reported failures which I am certain in many instances were due to changes introduced. I insist that the technique should be carefully followed, if good results are to be expected.

Dr. JAS. F. MCKERNON : I should like to add a word in regard to those cases where the vertigo is not constant. During the past three years I have had cases under observation in which the tube was open and nothing seemed to be wrong. I speak of this because in the treatment I employed that which was not mechanical but therapeutical. There seemed to be something in these cases from a hereditary standpoint, a rheumatic or gouty tendency, and so salicylates and colchicum were used. Where the vertigo was not constant, after the administration of these remedies for a period of six weeks, there was marked improvement. These cases were eight in number, six of whom I have recently heard from ; they have been out from under observation for seven months and there has been no recurrence of the vertigo. In some cases where the tube is not wide open these drugs help. One case I remember in particular was a man fifty-four years old, with the tube markedly stenosed. He had been under the care of a prominent neurologist of this city, and later was in an asylum, committed as an insane person. It was said that he was not insane, but he was placed there because he could not be kept quiet. He was subject to vertigo and pitched forward all the time. Members of his family succeeded in getting the man out of the insane asylum and the neurologist brought him to me. I found that the Eustachian tube was markedly contracted its entire length. It took me four sittings of ten minutes each to get through into the middle ear. The negative pole was used in the tube. There has been no vertigo since, and he was under observation for a period of six weeks. I have not used this method on him for over a year now. He has been under strict observation ; the last time I saw him was about three weeks ago, when the tube was patent. In another case, where the Eustachian tube was tight, there were recurrent attacks of vertigo from time to time.

Dr. **Brandegee**: I have never used this method in treating primary involvement of the labyrinth; I have treated only secondary affections of the labyrinth due to middle-ear changes. In all the cases the vertigo was not constant. In eight of them it was constant; in six of them it was not. I have never used this method of treatment in Ménière's disease at all.

I did not intend to convey the impression that all vertigo cases were due to strictures of the Eustachian tube; but, in all the cases that were reported, vertigo was connected with stenosis of the tube. It was proven that all cases were cured by restoring the patency of the Eustachian tube. It seems to me a curious fact that more men do not follow this method of treatment. I hear men saying they were doing this and doing that, and I do not wonder that they do not get the same results as Dr. Duel; they should follow the technique as laid down and follow it accurately, if they wish for success. As I stated in my paper, the results astonished the patients, and they were certainly astonishing to me. It certainly was striking that such results could be obtained, such marked relief, especially when the symptoms had extended over so many years.

REPORT ON THE TRANSACTIONS OF THE OTOLOGICAL SOCIETY OF THE UNITED KINGDOM.

MEETING MONDAY MARCH 4, 1901.

BY MR. A. H. CHEATLE.

THE PRESIDENT, SIR WILLIAM B. DALBY, IN THE CHAIR.

The following patients were shown and the following communications made.

Mr. CHEATLE showed a patient upon whom he had performed the **complete post-aural operation.** The whole antro-tympanic cavity had become lined by a dry, glistening epithelium, and he wished to ask how such an epithelial lining differed from the lining membrane of a cholesteatomatous cavity.

Mr. URBAN PRITCHARD said that in the one case the epithelium was derived from skin, in the others from mucous membrane.

Dr. DUNDAS GRANT urged the advisability of leaving the lining membrane of a cholesteatoma in certain cases.

Mr. BALLANCE said that in the ordinary form of cholesteatoma there was no lining membrane at all, and that the appearance of a membrane was simply due to the flattening from pressure of the cells forming the cholesteatoma. He strongly deprecated leaving any portion of the cholesteatoma behind.

Mr. FAGGE showed a patient with a **closed meatus** and with **facial paralysis** as a result of a Mauser bullet wound, and asked whether the meatus should be opened up, considering that the middle ear appeared to be intact.

Mr. CHEATLE thought that the meatal stenosis should be removed.

Dr. LAW doubted whether in this case the middle ear was intact, and did not consider that the patient would derive any benefit from operation.

Dr. MILLIGAN thought that the cicatricial stenosis should be dissected out and a portion of the bony meatus removed at the same time to try to obviate recontraction.

Mr. DE SANTI considered operation inadvisable, as also did Dr. LAMBERT LACK.

Dr. MACNAUGHTON JONES considered no danger was to be anticipated in attaching the cicatricial band.

Mr. PRITCHARD said that he was inclined to leave things as they were.

Mr. BALLANCE advocated removal of the scar and union of the cut ends of the facial nerve, which was evidently divided outside the stylo-mastoid foramen.

Dr. DUNDAS GRANT showed some teaching diagrams for the explanation of Weber's and Rinne's tests.

Mr. R. LAKE showed the following specimens: (1) **absence of tendon of tensor tympani**; (2) **pigmented warty growth from the auricle** of a female aged fifty years; (3) **caries necrotica of the outer antral wall** from a child aged four years.

Dr. ST. CLAIR THOMSON showed a **foreign body which had remained innocuously in the meatus for twenty-six years.**

Dr. MACNAUGHTON JONES referred to a case where a grain of shot had remained in the ear for seventeen years.

Mr. CHEATLE referred to the advisability of removing all foreign bodies under antiseptic precautions.

Dr. MILLIGAN said that it was very desirable that there should be no undue haste in removing foreign bodies unless urgent inflammatory symptoms were present.

Dr. PRITCHARD referred to a case where a cherry-stone had been in the ear for fifty years.

Dr. H. JONES read the notes of a case of **temporo-sphenoidal abscess in which operation had been followed by recovery** and showed a specimen and microscopical sections from **a child aged two years who died in convulsions twenty-four hours after the ordinary mastoid operation.**

The cases were discussed by Mr. Cheatle, Mr. Lake, and Dr. Milligan.

REPORT ON THE PROGRESS IN OTOLOGY DURING THE THIRD QUARTER OF 1900.

(Concluded from page 176.)

BY DR. ARTHUR HARTMANN.

Translated by Dr. ARNOLD KNAPP.

NOSE AND NASO-PHARYNX.

a.—METHODS OF EXAMINATION AND TREATMENT.

237. **Rethi.** External rhinoscopy. *Monatschr. f. Ohrenhlk.*, No. 5, 1900.

238. **Stein.** Examination of nasal function. *Hospitalstidende*, Nos. 41–43, 1900.

239. **Neumann.** The nasal douche. *Bolnitschkaja Gaseta Botkina*, No. 12, 1900.

240. **Lermoyez** and **Mahu.** Hot air in the treatment of the upper respiratory passages. *La presse médicale*, No. 59, 1900.

241. **Lermoyez** and **Mahu.** A new method of treating nasal affections with hot air. *Ann. des malad. de l'or., du lar.*, xxvi., 7.

242. **Hoffa.** Operations on the nose. *Arch. f. Laryng.*, x., 3.

237. RETHI described Bergeat's method of external rhinoscopy in 1892. KILLIAN.

238. STEIN has experimented with the olfactometric technique of Zwaardemaker and describes several olfactory standards and gauges. STEIN.

239. Owing to the danger of all methods of nasal irrigation, NEUMANN recommends pouring a 20 % solution of menthol in liquid paraffine in the nose to cleanse the latter and the naso-pharynx; adults receive 5 to 10 drops, children 1 to 5 drops in each nostril, while the head is held back. If the nose is occluded, pledgets of gauze soaked in this solution are inserted for 15 to 20 minutes. SACHER.

240–41. Dry warm air of 70° to 90° C. is applied by a particular apparatus to the affected part of the nose or naso-pharynx under rhinoscopic guidance. The temperature and pressure can be regulated. Sittings of 2 to 4 minutes' duration are held every other or third day. The opening of the canula should always be 2 to 3 *mm* distant from the mucous membrane, though care must be taken not to cause burning. After the treatment the patient should keep to the room for a half-hour. The treatment is indicated in all forms of vasomotor rhinitis, in the simple chronic catarrh, the subacute catarrh of the Eustachian tube, and in reflex otalgia from nasal catarrh. It should be tried in hay fever. In chronic middle-ear sclerosis and ozæna it proved to be unavailing.

SCHWENDT.

242. HOFFA describes three cases where he had successfully removed protuberances on the nose by subperiosteal resection of the bone and cartilage; a saddle-shaped deformity of syphilitic origin, by an osteoperiosteal flap from the tibia; finally a case of adhesion between the lower turbinal and the septum in a patient suffering from a severe neuralgia, where the neuralgia was also relieved by the operation. ZARNIKO.

b.—GENERAL SYMPTOMATOLOGY AND PATHOLOGY.

243. **Kafemann.** Psychologic investigation of the so-called nasal aprosexia. *Arch. f. Laryng.*, vol. x., 3.

244. **Alkan.** Certain varieties of hard palate and their origin. *Arch. f. Laryng.*, x., 3.

245. **Muck.** On the presence of rhodan in nasal and conjunctival secretions. *Münch. med. Wochenschr.*, No. 34, 1900.

246. **Bliss, Arthur Ames.** Severe hemorrhages after operations on the throat and nose. Report of five cases. *N. Y. Med. Jour.*, Sept. 8, 1900, and *Amer. Laryngol. Association.*

247. **Hopkins, Fred. E.** Secondary hemorrhage, following the use of suprarenal extract. *N. Y. Med. Jour.*, Aug. 25, 1900, and *Amer. Lar. Ass.*

248. **Jones, Noble W.** The presence of virulent tubercle bacilli in the healthy nasal cavity of healthy persons. *N. Y. Med. Record*, Aug. 25, 1900.

243. KAFEMANN has attempted to investigate in Kraepelin's psychological laboratory whether or no it be possible to influence the mental activity in a healthy individual by impeding nasal respiration. It seems from his results that this is possible. Unfortunately the article is vague and the technical terms unintelligible to one not a psychologist. ZARNIKO.

244. ALKAN comes to the following conclusions: 1. The hard

palate of the new bone is very short. With increasing years the height and breadth enlarge slowly, while the length increases relatively rapidly. 2. In people with adenoid vegetations the palate is regularly high, long, and narrow. 3. The configuration of the hard palate does not correspond to the shape of the skull. 4. Anomalies of position of teeth are frequently met in abnormal maxillary and palatal formations and may be the results of the latter.

ZARNIKO.

245. When rhodan was detected in the saliva, it was present also in the nasal secretion. Its presence in the conjunctiva could also be determined. MUCK believes that the bactericidal quality of the nasal secretion was invested in rhodan. SCHEIBE.

246. Cases 1 and 4, adults, were operated for septal displacement and papilloma of the lower turbinate respectively, and controlled by plugging. Cases 2 and 3 were hemorrhages from tonsillotomies in a boy æt. two and a woman æt. thirty-one, respectively, controlled with hemostatics. Case 5. Anæmic boy, æt. seven, mouth-breather, had enormous adenoids and extreme deflection of septum to the left. The brother, cousin, and uncle on the mother's side were bleeders, as it was found out after operation, which was an Allen's supralabial resection for deviated septum, and an excision of adenoids. During the following night there must have been considerable oozing of blood. On the next morning, an alarming bleeding from nose and naso-pharynx was controlled by packing. The death of the exsanguinated child ensued after four days, in spite of ergot, strychnine, and transfusion. The patient had formerly suffered from swellings of the joints and extensive ecchymoses following contusions. M. TOEPLITZ.

247. In considerable proportion of operated cases, hemorrhages occurred at intervals of from 2 to 6 hours after operation, and was more frequent when the suprarenal extract was used in combination with cocaine than when cocaine alone was applied, and was more marked in operations on the turbinates than on those of the septum. A number of laryngologists confirmed the occurrence of secondary hemorrhages, except those who pack after operations. Suprarenal extract alone seems beneficial in acute cases, with a few exceptions as idiosyncrasies, while, when used with cocaine, there is too much secondary relaxation.

M. TOPELITZ.

248. JONES tried to answer the following questions — 1. Are

tubercle bacilli to be found in the nasal cavities of healthy individuals following the ordinary vocations of life? 2. Are they to be found in larger proportions in those more or less intimately connected with the tuberculous?—by the following experiments: He removed the entire contents of the nasal cavities of men in good physical health by means of sterilized cotton swabs, which were washed in test tubes containing 10 *ccm* of sterilized normal salt solution, and inoculated with these thirty-one animals. The results are briefly tabulated. Three out of twenty-nine developed tuberculosis. Jones answers the first question affirmatively, and the second by stating that the tubercle bacilli are not as frequent in these persons as in those who have the care of the tuberculous. M. TOEPLITZ.

c.—OZÆNA.

249. **Farlow, John W.** A case of ozæna of probably sphenoidal origin. *N. Y. Med. Journ.*, Sept. 29, 1900, and *Amer. Laryng. Assoc.*

250. **Logan, James E.** Atrophic rhinitis. *N. Y. Med. Journ.*, Sept. 1, 1900, and *Amer. Laryng. Assoc.*

249. A female patient, aged twenty-one, had offensive crusts in the left nostril with the inferior turbinal shrunken, and the mucous membrane atrophied. The probe was pushed into the sphenoidal sinus, which was then washed out, whereupon odor and crusts disappeared. Occasional probing, curetting, and washing of the sinus keep the nose in good condition.

M. TOEPLITZ.

250. In discussing the different theories on causation of atrophic rhinitis—(1) hypertrophic rhinitis as initial lesion; (2) suppurative rhinitis in childhood; (3) specific germs; and (4) preexisting suppuration of accessory sinuses—LOGAN rejects the first three. However, he believes that the middle turbinated body is more inclined to atrophy, due to suppurative ethmoiditis. He illustrates this view by three cases, which were greatly benefited and cured respectively by the removal of the middle turbinal followed by opening of the anterior, and, if necessary, of the posterior ethmoid cells with subsequent curettement.

M. TOEPLITZ.

d.—NEW GROWTHS.

251. **Barrago-Ciarella.** On the not unusual presence of blastomycetes in nasal polypi. *Arch. f. Laryng.*, x., 3.

252. **Lombard.** Clinical cases. Three cases of mucous polyps of the choanæ. *Ann. des. mal. de l'or., du lar.*, xxvi., 5.

253. **Parker, C. A.** A case of radical operation for nasal polypi. *Proc. Laryng. Soc.*, London, June 1, 1900.

251. Barrago-Ciarella has stained sections of nasal polypi hardened in Müller's fluid or alcohol after the method of Sanfelice and Aievolli, and discovered peculiar-looking structures which he regards as blastomycetes, and of some etiological significance.

Zarniko.

252. Lombard describes three cases where the polyp twice arose from the choanal margin, and once from the posterior end of the middle turbinal. The polyps were grasped by the loop of a cold snare introduced through the nose, and the finger in the naso-pharynx serving as a guide. Zimmermann.

253. A man aged thirty years had had several previous operations for polypi, and returned in as bad a condition as ever. Under a general anæsthetic, the polypi, middle turbinate, and the ethmoidal cells were all thoroughly removed in the manner advocated by Lambert Lack. The result was excellent.

Arthur H. Cheatle.

e.—SEPTUM.

254. **Killian.** A case of acute perichondritis and periostitis of the septum of dental origin. *Münch. medic. Wochenschr.*, No. 6, 1900.

255. **Krieg.** The operation of window resection of the septum for scoliosis septi. *Arch. f. Laryng.*, vol. x., 3.

256. **Loewe.** The surgery of the nasal septum and the upper accessory cavities of the nose. *Monatschr. f. Ohrenhlk.*, No. 7, 1900.

254. In Killian's case after two days of toothache the nose became occluded, with fever up to 40°. On the seventh day escape of a large amount of fetid pus. On examination, the mucous membrane over the entire septum was bulging. A large part of the cartilaginous septum was destroyed by the inflammatory process. A probe could be passed near to the lamina cribrosa, posteriorly to the vomer; the entire septal mucous membrane was elevated. Recovery took place after treatment with gauze tampons soaked in alum. acetat. solution. A half year later a cyst filled with pus, touching the floor and septum of the nose, was found connected with the root of the diseased tooth. This was healed by removing the anterior wall. Hartmann.

255. A summary report of 130 window resections. Perforations of the septum rarely follow. The operation is a very difficult one, but should be studied and practised as long as there is none better. Zarniko.

256. Loewe recommends for a submucous resection of the bent and thickened cartilage to operate through the mouth after

detaching and raising the skin of the face to the lower orbital margins. The severity of this procedure for simply a deviated septum seems out of proportion and unjustified. KILLIAN.

f.—ACCESSORY CAVITIES.

257. **Killian.** The diseases of the accessory cavities of the nose. Reprint from the *Handbuch der Laryngologie und Rhinologie.*

258. **Ziem.** On the etiology and treatment of purulent diseases of the nose and its accessory cavities; the importance of the ductus and hygroma. *Monatschr. f. Ohrenheilk.*, No. 9, 1900.

259. **Stanculeanu** and **Raup.** Bacteriology of empyemas of the accessory cavities. *Arch. internat. de laryng., d'otol.*, etc., vol. xiii., No. 3.

260. **Lubet-Barbon** and **Furet.** On the diagnosis of maxillary empyema with gumma of the antrum. *Arch. internat. de laryng., d'otol*, etc., vol. xiii., No. 3.

261. **Lack, Lambert.** Case of a male aged twenty years, with distension of the maxillary antrum. *Proc. Laryng. Soc.*, London, June 1, 1900.

262. **Tilley, Herbert.** Chronic empyema of the frontal sinus with notes on the treatment of fourteen cases. *Lancet*, July 14, 1900.

263. **Denker.** Rhinogenous abscess of the frontal lobe and extradural abscess in the forehead, healed by operation. *Arch. f. Laryng.*, x., 3.

264. **Botesat.** Trephining of the frontal sinus for empyema. *Wojenno-medizinski Shurnal*, March, 1900.

265. **Zimmermann.** An osteoma of the frontal sinus. *Deutsche Zeitschr. f. Chir.*, Nos. 3 and 4, 1900.

266. **Mentow.** A case of cutaneous emphysema after traumatism to the frontal sinus. *Eshenedelnik.*, No. 24, 1900.

267. **Souza, Valladarez.** Two cases of empyema of the left sphenoidal sinus. *Ann. des malad. de l'or., du lar.*, xxvi., 9.

257. KILLIAN gives a complete exposition of the diseases of the nasal cavities and of the frontal sinus, including the anterior ethmoid cells. In the historical introduction it is stated that the maxillary and frontal sinus were first taken notice of and the treatment was done by general surgeons. The knowledge of ethmoid- and sphenoid-sinus disease is due entirely to rhinologists.

Among the various foreign bodies observed in the sinuses, animal and also vegetable parasites are observed. An operative treatment is necessary if a sinusitis is present. As non-inflammatory process exudates occur in cavities following general dropsy from contracted kidney or cirrhosis of the liver, pus may gain the antrum of Highmore. In these cases extraction of a tooth and a few irrigations may result in a cure.

The author separates from the chronic sinusitis a sinusitis cum dilatatione and a sinusitis exulcerans atque abscedens, of which the first results from pressure in closed ostia, and the last is similar to the cases of acute inflammation dependent on severe virulence of the micro-organisms. These two varieties can of course be associated, as in a case of the author's where the anterior bony wall of a much dilated cavity was replaced by a granulating and ulcerated soft surface.

In the radical operation of the frontal sinus Killian recommends the osteoplastic resection of the anterior wall if the sinus is very large, otherwise he prefers to resect the anterior and lower walls, leaving the orbital margin to prevent disfiguring sinking in. The temporary resection of the nasal bone permits access to the anterior ethmoid cells and makes a broad communication with the nose possible.

In the thirty cases of intracranial processes in chronic frontal sinusitis, changes in the cerebral wall were found in twenty-five. The author has recently published a case where this wall was found macroscopically normal in presence of an abscess in the frontal lobe. Luc's advice to puncture the brain to a depth of 4 *cm* in suspected abscess is unjustified, as in the author's measurements the anterior horn was found only 2.7 *cm* from the surface.

The diagnosis of primary carcinoma of the maxillary antrum has not been sharply defined. Anæsthesias in the peripheric branches of the infraorbital nerve, caused by pressure of the tumor, are characteristic; diagnostic puncture is negative, while transillumination is positive; partial or total change in the shape of the superior maxilla must be considered. In brief, this subject is treated in a most careful and painstaking way and can be recommended to any one desirous of becoming thoroughly acquainted with the subject or its literature. DENKER.

258. ZIEM describes the factors which are of injurious influence to the condition of the nose and its accessory cavities: 1 Overlooked diseases of the teeth and upper jaw. 2. Badly ventilated rooms and impure air. 3. Tobacco and alcohol. 4. Taking cold, especially in the head. KILLIAN.

259. Seventeen empyemata of the maxillary and frontal sinuses were examined bacteriologically. In empyema due to carious teeth, the bacillus ramosus, perfringens, and serpens are frequently present and belong to the anaërobic species. The pus in these cases is fetid. In the empyema of nasal origin the pus is not fetid; pneumococci and streptococci are frequent. Exceptionally the bacillus perfringens is present. Animal experiments proved the virulence of all of these micro-organisms.

SCHWENDT.

260. In the simple empyema of the maxillary antrum the suppuration is profuse; pus is evacuated from time to time as the cavity becomes over-filled. The fetor is noticeable to the patient himself. Granulations are found on the walls of the antrum. A complicating ethmoiditis gives rise to nasal polypi and occasionally to small sequestra. The bony wall itself is unaffected. In the gumma of the sinus wall the antrum is obliterated with granulations; the bony wall becomes eroded in places with perforations into the nose and nasal pharynx. The pus is cheesy, inspissated, and discharges constantly. The fetor is not noticeable. The nose is obstructed by a hard swelling of the turbinals and walls irreducible by cocaine; the external surface of the nose is frequently swollen and tender. SCHWENDT.

261. The upper wall of the left antrum was pushed upwards and the inner was bulging into the nose, causing partial obstruction. To transillumination the left antrum was equally translucent with the right. On puncture no pus was found, but on making a large opening through the canine fossa the cavity was found full of ordinary polypi. ARTHUR H. CHEATLE.

262. This is a most instructive paper and represents the latest method adopted in England for the treatment of frontal sinus suppuration. The whole paper should be studied.

A noteworthy addition has been made by TILLEY. In three cases, after the paper was written, he has successfully grafted the cavity by Thiersch's method. ARTHUR H. CHEATLE.

263. DENKER's patient was seventeen years old and complained of pains in the left frontal region and eye, with fetid discharge from the nose. Rhinoscopically suppurations of the anterior ethmoid cells and of the frontal sinus were found. Endonasal treatment proved unavailing and the external operation was resorted to. In the second week after the operation the condition grew worse; apathy, stupor, slow pulse, involuntary discharge of the urine and fæces; temperature rose to 39°. Second operation on the fifteenth day; the posterior wall of the frontal sinus was opened and an extradural abscess discovered. The dura was incised and aspiratory puncture detected an abscess in the frontal lobe filled with fetid pus which was evacuated. To reduce the prolapse a plastic was performed on the eighteenth day. Recovery took place and has now been healed for six years. In his remarks the author discusses the symptoms, operative technique,

and functional result. The case is the first rhinogenous brain abscess cured by an operation. ZARNIKO.

264. BOTESAT'S case is peculiar because though the anterior bony wall was destroyed the pus was not able to gain an external opening on account of the thickened periosteum. Recovery after trephining. SACHER.

265. A waiter, seventeen years of age, was taken ill with acute symptoms of a frontal sinus suppuration, two and one-half years after an injury on the head. A gradually progressive swelling of the left frontal area had been disregarded. The left eye was closed, the eyeball was prominent and displaced down, retinal congestion and diplopia. The region of the eyebrow was uneven and thickened. The operation revealed an osteoma which had perforated the sinus walls toward the brain, eye, and nose, and had originated at the juncture of the frontal and ethmoid bone in the floor of the sinus. An acute sinusitis was also present. The osteoma was composed of cancellous bone with a firm shell, but there was no cartilage. ZIMMERMANN believes it to be of periosteal origin, and due to a traumatic interruption of the development of the frontal sinus. BRÜHL.

266. MENTOW'S patient struck his forehead against a rafter. On the following day he complained of severe dyspnœa, dysphagia, pain in the right half of the neck and supraclavicular groove. A doughy swelling occupied the right half of the neck, giving tympanitic resonance on percussion and distinct crepitation on palpation. The anterior wall of the frontal sinus was fractured. All symptoms disappeared after two weeks. The absence of emphysema in the face was remarkable. SACHER.

267. The first case was that of a man aged forty, who had suffered from intermittent fetid discharge from the left nostril since childhood. The second was a man, thirty years old, who woke up in the morning with the sensation of a foreign body in the throat, which disappeared after blowing his nose and evacuating crusts and pus. Objectively there was pharyngitis sicca, and pus on the median side of the middle turbinate. Healing occurred after enlarging the opening into the sphenoid sinus and curetting.

ZIMMERMANN.

g.—OTHER DISEASES.

266. **Wolff, D.** Fibrinous or pseudo-membranous rhinitis. *Dissertation*, Leipzig, 1899.

267. **Peltesohn.** The treatment of fibrinous rhinitis. *Therapeutische Monatshefte*, Sept., 1900.

268. **Moliné.** Nasal hydrorrhœa. *Arch. internat de laryng., d'otol.*, etc., vol. xiii., No. 3.

269 **Cozzolino.** On the importance of free nasal respiration in the treatment of consumption. *Monatschr. f. Ohrenhlk.*, No. 6, 1900.

270. **Baup.** Latent tuberculosis of the three tonsils. *Ann. des mal. de l'or., du lar.*, xxvi., 5.

271. **Gerber.** On scleroma, especially in East Prussia. *Arch. f. Laryng.*, x., 3.

272. **Baurowitz.** On scleroma ; a study of one hundred cases. *Arch. f. Laryng.*, x., 3.

273. **Buck, Louis.** Hæmophilia in the negro. *N. Y. Med. Rec.*, July 28, 1900.

274. **Holmes, Christian R.** Hypertrophy of the turbinated bodies. *N. Y. Med. Jour.*, Sept. 29, 1900.

275. **Curtis, H. Holbrook.** The immunizing cure of hay fever. *Med. News*, July 7, 1900.

266. In WOLFF's dissertation the literature on fibrinous rhinitis has been thoroughly compiled ; in addition, four cases are described. In all, true diphtheria bacilli were found, but fever and general symptoms were absent. The treatment with iodoform insufflations appears to have been quite satisfactory.

HARTMANN.

267. PELTESOHN has been able in twelve cases to rapidly free the nose of membranes and to remove the nasal obstruction by the application of a cyanide of mercury solution 0.02 : 50.0.

HARTMANN.

268. Hydrorrhœa nasalis frequently accompanies other affections. MOLINÉ describes that variety where the hydrorrhœa is the principal symptom, a profuse constant discharge without any irritating cause or pain. In one case the secretion was quite different from the lymph usually found ; reaction was acid, no albumen, but much mucin. Hence there appear to be two varieties of hydrorrhœa. SCHWENDT.

269. COZZOLINO writes of the importance of free nasal respiration in the treatment of consumptives. KILLIAN.

270. BAUP examined forty-eight faucial and pharyngeal tonsils. Aside from the various pathological changes found present in the epithelium and connective tissue, evidence of tuberculosis was present in only one, in the pharyngeal tonsil of a boy aged fourteen. Tubercle bacilli in groups of two and three were found in a number of sections in an area of greater

infiltration of connective tissue, which the author regards as an expression of a reactive-curative process. Inoculations proved the tuberculous nature. The significance of these cases of hidden tonsillar tuberculosis is important in the causation and in other localizations of tuberculosis. ZIMMERMANN.

271. GERBER gives ten complete case-histories. In one case typical rhinoscleroma was combined with carcinoma. The others showed the following peculiarities: external changes in nose were wanting in all, internally the conditions were normal in two, ozæna was present in three, hyperplastic rhinitis in one, and scleromatous changes in the rest. The septum was always thickened posteriorly, narrowing the choanæ. Naso-pharynx was normal. In three cases the larynx showed subglottic stenosis, in the others subglottic hypertrophies. Of nine cases, five came from Russia, five from East Prussia. The author thinks that his cases belong to a special subdivision, as the virus was attenuated and symptoms correspondingly mild. ZARNIKO.

272. BAUROWITZ gives a detailed description of the history, peculiarities, pathology, and site of scleroma. One hundred case-histories are added, and finally a review of the cases is given according to the location in the respiratory tract, clinical appearances, and therapeutic rules. ZARNIKO.

273. BUCK reports two cases of severe nasal hemorrhage in a colored man, thirty years old, and in a colored woman, twenty-seven years old, in whom suprarenal extract with plugging was tried with but temporary success; the bleeding was finally controlled by calcium chloride internally, combined with anterior and posterior plugging. M. TOPELITZ.

274. After a careful description of the pathological changes of the turbinated bodies, HOLMES asserts that, when the second stage of hypertrophy is reached, a cure is effected only by surgical interference. His observations are based upon 1500 operations in private practice. The use of caustics and galvanocautery is now abandoned, small saws and curved alligator scissors are used instead, in order to produce a bone scar. He removes almost the entire lower turbinal, leaving a small piece at the anterior end intact, but he includes the posterior end. Holmes operates these cases in the hospital and enforces rest upon the patient for a few days after operation. M. TOEPLITZ.

275. Violent attacks of neurotic coryza brought about by any

exposure to perfume of flowers were combated in a woman, æt. thirty-five, by immunizing her with the watery extract of roses, violets, lilies of the valley, and their pollens, given internally and hypodermically.

Another patient working in the ipecac department of a drug store was seized with neurotic coryza and could return there only by taking some tincture or syrup in drop doses for several days.

The administration of the causative drug, also, in goldenrod and ragweed coryza, lessens the coryza. The tincture and fluid extract of ragweed, which as the recognized king of pollens produces hay fever, administered in two- to ten-drop doses t. i. d. in water during the two weeks preceding the paroxysm, ought to be tried.

M. TOEPLITZ.

h.—NASO-PHARYNX.

276. **Goldschmidt.** The influence of removal of adenoid vegetations on diseases which are caused by them. *Wien. klin. Wochenschr.*, No. 35, 1900.

277. **Pollatschek.** Clinical cases from the Dispensary for Children in Prague. *Prag. med. Wochenschr.*, No. 43, 1900.

276. GOLDSMITH has collected from literature the sequelæ of adenoid vegetations and how they are influenced by the removal of the latter. POLLAK.

277. POLLATSCHEK relates the results obtained by feeding thymus gland in tonsillar hypertrophy and in spasm of the glottis. Six children were experimented on without result.

HARTMANN.

SOFT PALATE, PHARYNX, AND MOUTH.

278. **L'Abbe** and **Sirugue Lévy.** Structure and physiology of the faucial tonsil. *La presse médicale*, Aug. 3, 1900.

279. **Harmer.** Examination of the membrane occurring on the tonsils after tonsillotomy, and its relation to diphtheria bacillus. *Wien. med. Wochenschr.*, No. 38, 1900.

280. **Tarassewitch.** A case of angina with fusiform bacteria and spirilla. *Russkij Archiv Patologii*, etc., Nov., 1899.

281. **Speranski.** A case of necrotic angina caused by Vincent's fusiform bacteria. *Djetskaza Medizina*, May–June, 1900.

282. **Lombard** and **Caboche.** Two cases of peripharyngeal abscesses. *Ann. des mal. de l'or., du lar.*, xxvi., 5.

283. **Sayssin.** Sublingual colloid cysts. *Wojenno medizinski Shurnal*, Feb., 1900.

278. In the interior of the follicles lymphocytes are formed, which became converted into mononuclear leucocytes and eosinophile cells. These find their way into the lymph vessels; several

leucocytes appear on the surface of the mucous membrane. The leucocytes serve as protectors against micro-organisms and toxines from their phagocytic properties and their antitoxic actions. In the tonsillar crypts of healthy individuals, pneumococci, streptococci, stapylococci, and tubercle bacilli can be found. The crypts act as filters which prevent the entrance of malignant organisms. If the tonsils are so large as to interfere with respiration they no longer fulfil their function. SCHWENDT.

279. HARMER examined the membranous deposit found after tonsillotomy and found bacteria present only in the membrane; the adenoid tissue was infiltrated with round cells. The pyogenic bacteria were the streptococcus and staphylococcus but never the diphtheria bacillus. POLLAK.

280. During a diphtheria epidemic TARASSEWITCH observed a case of angina with a few follicles in a child of six years. Temp. 38.4°. Pulse 126. Recovery in ten days. Repeated microscopic examinations showed a large quantity of Vincent's bacilli and spirilla which could not be stained according to Gram.
SACHER.

281. A child, aged nine, was taken ill with tonsillitis. Both tonsils and the soft palate were red and swollen. The right tonsil was covered with a dirty gray deposit. General condition good; no fever. Bacteriologic examination revealed numerous fusiform bacilli and spirilla and a small number of other micro-organisms. There were no diphtheria bacilli. SACHER.

282. A short report of two rapidly fatal cases of peripharyngeal phlegmons with septic intoxication. ZIMMERMANN.

283. In SSYSSIN's case the tumor was as large as a hen's egg, occupied the entire floor of the mouth, and pushed up the tongue. Healing took place after enucleation of the cyst and repeated cauterizations of the cavity. The opening of Wharton's duct was found perfectly patent at the operation. SACHER.

BOOK NOTICE.

Lehrbuch der Ohrenheilkunde für Aerzte u. Studirende.

III.—By Dr. ADAM POLITZER, Professor of Otology at the University of Vienna. Fourth, totally revised edition; 710 pages of large octavo, with 346 text illustrations.

Politzer's work maintains its place as the international leading otological text-book, not so much for its adaptation to the undergraduate student, for whom, in our opinion, smaller compendia would be more suitable, but for the advanced student of otology, and for the general practitioner to familiarize himself intelligently and earnestly with the diagnosis and treatment of the many and important ear diseases which, from year to year, come before him with increased frequency and greater responsibility. The third (German) edition, appearing in 1893, had 619 pages. In perusing the fourth edition we notice no essential changes in the first 103 pages, anatomy, physiology, and the methods of examination of the ear. The latter, presented with all the detail permissible in a text-book, have received some additions. Among them is the beautiful method of Gradenigo to determine the duration of vibration of a tuning-fork with the sense of sight for the deeper sounds (below 60 double vibrations). A black triangle on white paper is pasted on the ends of the prongs of the fork. The double images, which at first are far apart, gradually approach each other, and form only one black triangle when the fork has ceased to vibrate (see Trans. VI. Internat. Otol. Congress at London, 1899).

Gradenigo proposed at the London Congress the following abbreviations which were adopted by the Italian Otological Society and are now in more or less general use, viz.: W = Weber's experiment; R = Rinne's exp.; S = Schwabach's exp. (duration of vibration); v = vox, voice; vc = voice of conversation; va = vox aphona, whispering; aP = acoumeter of Politzer; h = watch; ad = right ear; as = left ear.

In speaking of attenuation and compression of air in the external ear-canal, the author endorses the use of an electromotor massage instrument according to Breitung, and says that the hearing is not so much improved, but the subjective symptoms, tinnitus, dizziness, and stupor, are often greatly relieved; yet in certain cases they and the deafness are aggravated. Pneumomassage is contraindicated in all acute inflammations.

As regards the notation of the pitch of sounds by letters the reviewer cannot see why Politzer gives the following scale:

$C^{-2} = 32$ dv ; $C^{-1} = 64$ dv ; then $c = 128$; $c' = 256$, etc.

The reviewer is accustomed to use the scale of Helmholtz (*Tonempfindungen*, 1st and 2d editions, p. 30): $C^{-2} = 16$ dv ; $C^{-1} = 32$; $C = 64$; $c = 128$; c' or $c^2 = 256$; c'' or $c^2 = 512$, etc.

In German and frequently in English literature, the octaves are called as follows:

Subcontra octave,	C^{-2}	beginning with	16 dv.
Contra octave,	C^{-1}	" "	32 "
Large octave,	C	" "	64 "
Unmarked or small octave,	c	" "	128 "
Once marked octave,	c' or c^1	" "	256 "
Twice " "	c'' or c^2	" "	512 "

c^3 beginning with 1024 ; c^4 beginning with 2048 ; c^5 beginning with 4096, etc.

There is a small difference found in all these determinations. Helmholtz puts down C beginning with 66, etc., but the above numbers are the more usual.

The different methods of examining the auditory function are treated in a very clear manner, sufficient to furnish the basis and working material for a systematic, scientific, and practical examination in any case.

The diseases of the drum membrane, profusely illustrated by the author's practice and pathological investigations, are interesting and useful reading, giving also detailed and judicious rules of treatment. The remarks on acute and chronic diseases of the tympanic cavity, the Eustachian tube, and the mastoid process, p. 217, are very important, especially in a prophylactic way; the early recognition, appreciation, and treatment of these affections ward off chronic inflammatory annoyances with impairment of hearing and the dreaded deeper complications from neglect of early care. Paracentesis of the *Mt*, division of the posterior folds, and tenotomy of the tensor tympani are described.

Otosclerosis, so frequent, distressing, and little amenable to treatment, receives 12 pages, which are distinguished by the author's important pathological investigations on the primary affections of the labyrinth capsule, osseous ankylosis of the stapes, etc. The unsatisfactory results of the manifold attempts of treatment are critically discussed.

The rest of the book, more than half of its volume, comprises the subjects which form the importance, development, and pride of modern aural surgery. The acute middle-ear inflammations, their bacteriology, symptomatology, etc., receive 34 pages. Their occurrence in infants is duly dwelt upon.

In the chapter on the chronic purulent middle-ear inflammation the author by numerous illustrations of bacteriological and histological conditions and many pictures of the varied otoscopic appearances leads the reader through this extensive field of tedious observation (though not so discouraging as the chronic non-suppurative otitis media) into all the nooks and corners of this intricate system of cavities, the atrium with its diversified and irregular walls, the attic with its secluded chambers and their partition-walls, the ossicles, more or less abnormal in structure and position, the caries of the walls covered and impregnated with pus, debris of bone, cholesteatomatous masses, and polypoid granulation tissue. The reviewer is not aware that any one writer has given us such an exhaustive and authoritative description of these frequent and most important conditions as Politzer does on the next 49 pages of his book.

This is supplemented by a description of the peculiarities of the purulent middle-ear inflammations of infective disease—typhoid, scarlet fever, tuberculosis, syphilis.

Then follows a chapter (pp. 394–415) on the consequences of chronic otitis media, the various forms of caries and necrosis of the temporal bone and the ossicles, with their treatment by medicines and intra-aural surgical interference, the removal of the ossicles, etc.

This leads the way to the affections of the mastoid process (pp. 415–472). In the opinion of the reviewer, the author ascribes too great an importance to the full application of the antiphlogistic apparatus: Leiter-coil, painting with tincture of iodine, inunction of mercurial ointment, Crede's silver salve, etc. The reviewer thinks that in the initial period bed-rest and, as soon as the upper-posterior wall is sagging, a paracentesis accomplish more than all other remedies together. When a mastoid abscess can plainly be recognized, Politzer thinks that early opening—on the fourth or fifth day—is unfavorable to a smooth and rapid recovery, for the disseminate foci of suppuration have had no time to mature and coalesce, which statement seems correct to the reviewer.

The description of the simple opening of the mastoid distinguishes itself by thoroughness and classical precision. Politzer thinks that the general practitioner should be able to do this operation, with which we agree. But where shall the general practitioner acquire his experience in countries in which otology is not yet on the programme in the final examination? Just in this department a course of clinical studies should, and we trust will, soon be obligatory.

In the section of the opening of the mastoid process and the antrum, Politzer repeats his assertion that the majority of mastoid abscesses do not communicate with the antrum, and that in these cases the middle-ear suppuration is recovered from more readily if the antrum is not opened. The antrum should be opened only when the probe discovers a communication between the usually hard portion of bone and the antrum, or later if the patient is not materially relieved. This opinion of Politzer's is entitled to due consideration, but the reviewer confesses to be one of those that seek the antrum in most cases.

The primary mastoid inflammation affecting the lining mucosa of the pneumatic cells is in the great majority of cases also produced by extension of bacterial infection from the naso-pharyngeal cavity, but it is found rarely in diploic mastoids (osteo-myelitis).

"The destructive processes in tympanum and mastoid originate in otorrhœas of childhood, rarely in chronic otitis of adults. The largest contingent are furnished by the infective diseases, tuberculosis and cholesteatoma." This certainly speaks the sense of every experienced aurist. These processes may run a latent course for years. The anatomical conditions, eburnation, caries, necrosis, abscess in different parts, are well described. They require the operative exposure of the middle-ear cavities. The indications and varieties of operative procedures are clearly presented. Politzer does not recommend the "radical" operation in advanced conditions of tuberculosis. He does many radical operations, and performs them safely and cleverly, of which the reviewer could satisfy himself, not long ago, as an eye-witness in Politzer's clinic. But he warns against the abuse of the operation.

He describes the operation in detail, with many illustrations, and with constant reference to the many difficult steps and dangerous points. It would be going too far should we quote only a part of the rules of safety and the proper execution of each procedure. Politzer describes and illustrates also the most popular methods of meatoplasty—Stacke's, Panse's, Körner's. Hartmann's fenestrated and grooved meatal forceps are depicted (p. 462) as particularly useful in slitting the membranous canal. Ballance's method, published recently (*Med.-Chir. Trans.*, vol. 83, 1900), is briefly described.

The after-treatment, frequently so tedious and embarrassing, receives a good deal of attention. The uncertainty of the prognosis concerning the preservation of the hearing function is shown by the statistics of Stacke and Grunert.

The otogenous intracranial affections, extra- and intra-dural abscess, diffuse and serous leptomeningitis ; the brain abscess in the temporal lobe and the cerebellum and metastatic abscesses ; furthermore the cerebral ulcer and the diffuse encephalitis as well as the affections of the cerebral sinuses and the internal carotid, viz., the inflammation of the lateral sinus, the thrombophlebitis of the superior and inferior petrosal, the cavernous sinus, and the jugular bulb ; finally the erosion of the internal carotid, are all scholarly described, with a good support from personal experience, though, it seems, not by such a wealth of personal pathological research as the author could marshal out in the tympanomastoid diseases. Yet the presentation shows the conscientious utilization of all sources of available knowledge. The difficulty of the diagnosis of brain abscess and cerebellar abscess is presented and backed by the authors of incident publications (p. 488, etc.). The significance of the petro-squamous sinus, which Arthur H. Cheatle brought forward to the knowledge of the members of the VI. International Otological Congress and of which Dr. A. H. Cleveland described a case of pyæmia ending fatally (*Arch. of Otol.*, vol. xxiv., 1895), is fully brought forward.

The remainder of the work (pp. 506–684) does not appear to have received many additions after the appearance of the third edition.

Politzer's text-book is so complete and so conscientiously kept up that this fourth edition is as far ahead of the third as science has advanced after the year 1893. No one who possesses the last edition will dislike to be without the new one. For English readers it may be agreeable to learn that the new edition is in the hands of two competent translators, who, under the supervision of the author,—whose clinical assistants they are,—will soon bring out an English translation of the fourth German edition.

H. K.

APPOINTMENTS.

Dr. Otto Körner, who, under the title of professor honorarius, was the official teacher of Otology, Rhinology, and Larnyngology at the University of Rostock, Mecklenburg, received a call to succeed the late Prof. Kuhn at Strassburg, which he declined, whereupon the Duke-Regent of Mecklenburg converted his position at Rostock into a professorship in ordinary. This is the first appointment of an aurist to the full functions and honors of an ordinary professor in Germany proper. In Austria the professorship in ordinary had been established long before.

Prof. Urbantschitsch, of Vienna, has been appointed editor of the *Monatsschrift für Ohrenheilkunde*, vacant by the death of Prof. Jos. Gruber.

Prof. Kümmel, of Breslau, has been appointed the successor of the late Prof. Kuhn at Strassburg.

SOCIETY MEETING.

The *British Medical Association* will meet in Cheltenham, July 30 to Aug. 2. Mark Hovell is to preside over the section of Laryngology, Rhinology, and Otology.

EDITORIAL NOTICE.

The ARCHIVES OF OTOLOGY is a bi-monthly journal, published in annual volumes of about five hundred pages each, extensively illustrated with cuts in the text, half-tone text plates, and lithographic plates, many in colors.

About three quarters of the space is devoted to original papers, and the remaining quarter to a systematic report on the progress of otology, and to reports of societies, book reviews, and miscellaneous notes.

The papers and reports are original, and only accepted with the understanding that they are to be published in this journal exclusively. The original papers in the English edition appear in the German (*Archiv für Ohrenheilkunde*) either in full or in more or less abridged translations, and *vice versa*.

Any subscriber that wishes to refer to the original text of a translated or abridged paper may, by applying to the editor, obtain a reprint which, it is expected, he will return after perusal.

Original papers of value from any source are solicited.

Communications for the English edition of the ARCHIVES OF OTOLOGY should be addressed to DR. H. KNAPP, 26 West 40th Street, New York, or to DR. U. PRITCHARD, 26 Wimpole Street, W., London, England.

The subscription price of the ARCHIVES OF OTOLOGY is $4.00 per year, payable in advance. The price per number is 75 cents.

The ARCHIVES is sent postage free in the United States, Canada, and Mexico.

CONTENTS OF VOLUME XXX., NUMBERS 4 AND 5.

PAGE

1. On the Therapeutic Value of Vibratory Massage of the Drumhead. By Dr. **Schwabach,** of Berlin. Abridged and Translated by Dr. H. KNAPP 283

2. On Otogenous Meningitis. By Dr. **Jacob Cohn,** of Breslau. Translated by Dr. H. KNAPP 291

3. Retropharyngeal Abscesses after Otitis Media Purulenta. By Dr. **George Kien,** Strassburg. Translated and Abridged by Dr. J. A. SPALDING, Portland, Me. 304

4. Thrombo-Phlebitis of the Superior Longitudinal Sinus Following Inflammation of the Frontal Sinus. By Prof. **G. Killian,** Freiburg i. Br. Translated by Dr. ARNOLD KNAPP, New York. (With six illustrations on Plates VIII. and IX., *Zeitschrift für Ohrenheilkunde*, Vol. XXXVII.) 314

5. A True Cholesteatoma in the Posterior Cranial Fossa—Infected by Middle-Ear Suppuration—Operation—Recovery. By Dr. **O. Körner,** of Rostock. Translated and Abridged by Dr. EDWIN M. COX, of New York 323

6. A Case of Pyæmia Caused by Bilateral Otitis Media with Osteo-Phlebitis of the Temporal Bone. By Dr. **E. Rimini,** of Triest. Translated and Abridged by Dr. EDWIN M. COX, of New York. 326

7. Two Cases of Brain Abscess—Operation—Recovery. By Dr. **P. Manasse,** Strassburg. Abridged Translation by Dr. ARNOLD KNAPP, New York 328

8. The Technique of Intranasal Operations. By Dr. **Alfred Denker,** of Hagen. Translated and Abridged by Dr. EDWIN M. COX, of New York 332

9. The Histology of Aural Polypi. By Dr. **G. Brühl,** Berlin. Translated by Dr. ARNOLD KNAPP, New York 334

10. Operations on the Mastoid in Constitutional Disease. By Dr. **Ernst Barth,** Brieg, near Breslau, Germany. Translated by Dr. ADOLPH O. PFINGST, Louisville, Ky. 344

PAGE

11. Eye Disease in Relation to Tuberculosis of the Nasal Mucous Membrane, and the Treatment of the Latter by Means of Lactic Acid. By Dr. **V. Hinsberg,** Breslau. Translated by Dr. CARL MUND, New York 352

12. Report of the Tenth Meeting of the German Otological Society, Held in Breslau, May 24–25, 1901. By Dr. **Max Goercke,** Breslau. Translated by Dr. RICHARD JORDAN, New York . 363

13. Report of the Section on Otology of the New York Academy of Medicine. Stated Meeting Held May 8, 1901. By Dr. **R. C. Myles,** Secretary 390

14. Report on the Progress in Otology during the Fourth Quarter of the Year 1900 and during the First Quarter of the Year 1901. By Dr. **A. Hartmann.** Translated by Dr. ARNOLD KNAPP, New York, 398

15. Book Notices 452
    - IV.—Transactions of the Otological Society of the United Kingdom. Edited by Charles A. Ballance, M.S., F.R.C.S., and Arthur H. Cheatle, F.R.C.S.
    - V.—Oreille et Hystérie. By Dr. Fleury-Chavanne.

VOL. XXX. Nos. 4 and 5.

ARCHIVES OF OTOLOGY.

ON THE THERAPEUTIC VALUE OF VIBRATORY MASSAGE OF THE DRUMHEAD.

By Dr. SCHWABACH, of Berlin.

Abridged and Translated by Dr. H. Knapp.

IN the following pages I purpose to make known the results which I have obtained by the massage apparatus driven by an electric motor recommended by Breitung[1] for treating the different kinds of ear disease and progressive deafness, especially that known under the name of sclerosis. Breitung recommends that we should begin with the smallest number of excursions of the piston, and very gradually increase the number of vibrations. Thus far he has not used more than five piston-excursions of the scale. Very early he noticed a marked influence on the subjective auditory sensations produced by very rapid small vibrations. After vibrations had been applied for from one quarter to one half a minute the tinnitus disappeared almost regularly in every case, in some cases for several hours, in others for a longer time. There was, however, no case in which the tinnitus disappeared permanently. He assures us that, with careful handling, no unpleasant sequelæ follow the tympanic vibrations. The treatment ought to be continued for a long time, or permanently, for the object was, by rhythmical oscillatory movements of the drumhead and of the ossicles, to exert a gymnastic influence in order to obviate the progressive stiffness and ultimate anchylosis of those parts. In a later publication[2] he refers to improvement in acuteness of hearing by the use of his apparatus. In a respectable number of cases the patients were able to enjoy the visits to churches and theatres, and in a majority of cases those to operas and concerts. He says that there was no doubt that the effect of highly frequent concussions extended as far as and beyond the nervous apparatus. Ostmann[1] states that the objective conditions were changed in no case, and in none were the subjective noises aggravated; on the contrary, they were essentially improved, without, however, disappearing altogether. During the treatment the intensity of the subjective noises varied, but they reached their primary intensity again. The lower tone limit was often materially extended, and the duration of perception of the octaves from C—c^{v} repeatedly showed considerable increase. Ostmann considers vibratory massage indicated (1) in cases of chronic deafness from chronic hypertrophic middle-ear catarrh; (2) in cases of hardness of hearing remaining after the termination of an acute inflammation of the middle ear, as adjunct to the ordinary methods of treatment. It is contra-indicated in (1) all acute inflammatory conditions of the sound-conducting apparatus; (2) in affections of the sound-perceptive apparatus with normal sound conduction; (3) in middle-ear affections which have led to marked displacement (retraction of the chain of ossicles, simple chronic middle-ear catarrh) or to extensive atrophy or adhesion of the drum. The prognosis in a number of cases was very uncertain. We may assume that by a treatment of four weeks all possible results would be obtained. The effect of the vibratory massage did not depend upon mechanical concussion of the sound-conducting apparatus alone, but upon the improvement of the nutritive conditions of the tympanic mucous membrane.

---

[1] "Experimental Investigations on Massage of the Ear," *Arch. f. Ohrenheilk.*, Bd. 44, p. 201, u. Bd. 45, p. 39.

[2] *Monatsschr. f. Ohrenheilk.*, 1899, No. 8.

Zaalberg has thus far treated one hundred patients with Breitung's apparatus, and has occasionally noticed a considerable improvement in hearing in sclerosis, whereas the tinnitus nearly always disappeared[2]; he obtained an essential improvement of subjective noises in nineteen out of twenty cases of sclerosis. Charles S. Burnett[1] thinks that the inflation may be always replaced by massage, and speaks favorably of the results obtained, particularly in cases of chronic middle-ear catarrh with reaction of the drumhead and the ossicles. Panse,[2] at variance with the continuously repeated recommendations, says that massage is almost always without effect in sclerosis for the reason that it may loosen the incudo-stapedial articulation, and that it has scarcely any effect on the foot-plate of the stirrup. In chronic middle-ear catarrh, however, he recommends massage, combined with the use of the catheter. Lucae[3] is not in favor of the massage apparatus.

---

[1] *Zeitschr. f. Ohrenheilk.*, Bd. 35, p. 287.

[2] *Monatsschr. f. Ohrenheilk.*, 1900, No. 8, p. 309.

My own observations refer to 173 cases, 70 of one-sided, 103 of double-sided, affections of the auditory organ, on the whole, 276 affected ears. Massage was supplied by the Breitung apparatus put in motion through the electric street current in such a way that there were daily applications with low velocity, namely, 600 piston-excursions of 2 *mm* each. The number of excursions was gradually raised to 1200, corresponding to the current strength of $\frac{1}{3}$ ampère also with excursions of 2 *mm*. Greater excursions up to 5 *mm* were rarely used for they produced unpleasant vertigo. It is not necessary to supply the end of a Siegle's pneumatic speculum with a rubber tube. The duration of the seances was ordinarily one, two, rarely three, minutes. The tinnitus not rarely stopped a short time after the first sittings, for some minutes up to several hours. Longer treatment was given only to patients who positively asserted that they were materially improved. Some patients alleged considerable improvement in hearing which an objective examination did not confirm. The results of vibratory massage which I am going to report refer exclusively to cases which had been under observation from two months to two years or longer after the termination of the treatment.

I began the use of massage first in **cases of sclerosis** of the sound-conducting apparatus. I call sclerosis that form of ear affection which is distinguished (1) by progressive deafness; (2) by absence of objective changes in the tympanic cavity and drumhead (dulness and retraction); (3) by a shortening of the lower end of the tone series, by prolongation of the duration of perception for deep tones by bone-conduction, and negative or greatly shortened positive result of Rinne's experiment (Bezold's Triad). With regard to the alteration found by functional examination, mentioned under (3), we may assume that they essentially depended upon fixation of the sound-conducting apparatus, chiefly the foot-plate of the stirrup, most probably resulting from a primary affection of the labyrinth capsule, and not upon any catarrhal processes of the tympanic mucous membrane (according to the investigations of Bezold, Politzer, and Siebenmann). The acuteness of hearing was greatly diminished in all cases. I should not omit to mention that I gave little hope to patients with high degrees of deafness presumably caused by pronounced, and therefore irreparable, anchylosis of the foot-plate of the stirrup.

---

[1] *Transact. of the Amer. Otol. Soc.*, 36th meeting, vii., 2, 1899.

[2] *Encyklopaedie d. Ohrenheilk.*, Herausgegeben von L. Blau, p. 293.

[3] *Arch. f. Ohrenheilk.*, Bd. 47, p. 224.

In 81 auditory organs, 67 suffered from subjective noises, mostly with very unpleasant sensations of stupor. In all of the 81 auditory organs the deepest tones of the musical scale, 16, 32, 48 double vibrations, could not be heard. In 58 out of the 67 ears with subjective noises there was an immediate improvement after the first application of the massage, which, however, disappeared in several minutes. The noises returned in a great number of cases with the previous intensity and also the improvement in hearing was lost again. The latter showed a permanent improvement only in 4 ears out of 81; in 19 out of 69 there was diminution of noises, which was more favorable. The cases did not warrant a favorable prognosis if the first application of the massage was followed by improvement only; an unfavorable prognosis was given when the improvement was insignificant.

I treated by massage 27 cases, 8 one-sided and 19 double-sided, on the whole 46 auditory organs affected with **simple chronic middle-ear catarrh,** in particular its hypertrophic form, characterized by swelling and thickening of the mucous membrane and its sequelæ, the so-called adhesive catarrhal processes (Politzer), in the tympanic cavity; the otoscope showed more or less intense dulness and retraction of the drumhead. In 19 patients the cause was nasal and pharyngeal catarrh. In general the results of massage in this group of cases were better than in the sclerosing processes, particularly as to the acuteness of hearing. In sclerosis only 4 out of 81 (4.9 per cent.) showed permanent improvement. Out of 46 (39.1 per cent.) cases of simple chronic middle-ear catarrh, 18 showed a permanent improvement in acuteness of hearing. Subjective noises were permanently improved in 19 out of 67 (28.3 per cent.) cases and 16 out of 35 (45.6 per cent.) in simple chronic middle-ear catarrh.[1]

Encouraged by the not unfavorable results that were obtained in simple chronic otitis media, I have used this procedure also in **subacute middle-ear catarrh,** in which stupor is not rarely an essential symptom, besides tinnitus and hardness of hearing. Cases of serous exudation in the drum were not treated by massage, as they yielded readily to inflation, with or without paracentesis of the drum. 27 subacute cases, 18 one-sided and 9 double-sided, were treated by massage with the following results: Permanent improvement of the tinnitus and acuteness of hearing occurred in 16 (44.4 per cent.) ears; in 7 (19.4 per cent.) permanent improvement was obtained by combined treatment with massage and inflation after previous inflation alone, or massage alone, had been tried without notable effect. In 13 (36.1 per cent.) no permanent result was obtained.

Further, I beg to report the results in some cases of **influenza complicated with acute simple or purulent middle-ear inflammations** that had run their course. In 6 out of 11 ears the final result was a very great diminution, or complete cessation, of subjective noises, and in 6 out of 9 an essential improvement of the acuteness of hearing. In 6 patients, all women, who had had influenza aggravated by an otitis media, leaving disturbances in the sound-perceptive apparatus, massage treatment was applied with the following ultimate results: in only 2 was the tinnitus improved during the time of treatment but it returned afterwards.

---

[1] The author illustrates the improvement of this and other groups by reports of typical cases which, in the translation, have been omitted.

Of particular interest were the results of massage in the sequelæ of chronic middle-ear suppuration—*i. e.*, dry perforations, cicatrices, adhesions. Massage was used in 26 cases, 16 one-sided and 10 double-sided. The results showed improvement of the subjective noises, which as is usual in this condition were not very intense, in 22 out of 24 affected ears. There was improvement of hearing in 16 out of 36 ears. There was improvement in both tinnitus and hardness of hearing in only 18 ears (50 per cent.).

To conclude, I desire to mention that I treated for the sake of experiment **cases** with pneumo-massage **in a certain number of which a sure diagnosis of the seat of the affection could not be made, and in another number of which an idiopathic affection of the sound-perceptive apparatus could be assumed.** Of the latter (12 patients with 21 diseased ears) massage showed an improvement only in one double-sided case in so far as the subjective noises abated during the course of treatment but returned more strongly so soon as the treatment was discontinued. In all other cases the results of massage as to tinnitus and the acuteness of hearing was completely negative, and the treatment was, therefore, omitted after several trials. As to the cases in which a sure diagnosis of the seat of the disease could be made out (22 patients, 8 one-sided and 14 double-sided) the results of the massage treatment were as follows: Vertiginous symptoms, present in 2 cases, were permanently cured. Sharpness of hearing showed an improvement only in 1 case. In 3 cases the massage was completely ineffectual.

Briefly stated, **the results of my observations were as follows:** Among 43 cases of sclerosis of the middle ear an improvement in hearing was obtained in only 4.9 per cent. of the cases in which the impairment of hearing had not yet reached a high degree, whereas, a permanent cure of the subjective noises occurred in 28.3 per cent. Essentially better were the conditions in simple chronic middle-ear catarrh ; 39.1 per cent. showed a permanent improvement in hearing, and 45.7 per cent. showed an improvement in the subjective noises. Similar results were obtained in subacute middle-ear catarrh,—*i. e.*, permanent improvement of both hardness of hearing and tinnitus in 44.4 per cent. Still more favorable were the results in cases of influenza, or cases which had recently recovered from an acute influenza middle-ear inflammation ; 54.5 per cent. showed an improvement of the subjective noises, and 66.6 per cent. of the acuteness of hearing. Still more gratifying was the massage in the group of cases which showed the sequelæ of chronic suppuration of the middle ear ; in 91.6 per cent. there was either complete recovery or notable improvement in the subjective noises and unpleasant sensations, whereas the hearing power was essentially improved in only 55 per cent. In those cases where a precise diagnosis could not be made the results of the massage treatment were sufficiently good to justify further trial.

Based on the above reported experiences I may express my opinion as to the therapeutic value of the vibratory massage as follows: This treatment has showed itself a valuable adjunct in certain affections of the middle ear and deserves to be tried, especially when the hitherto customary methods of treatment have proved inefficient. Further I should say that the vibratory massage does very little good in that form of chronic hardness of hearing for which it has been particularly recommended, namely, sclerosis of the sound-conducting apparatus. Above all I would recommend the trial of pneumo-massage in patients suffering from subjective noises to such a degree as to render them unable to attend to their business. Vibratory massage is further to be recommended in cases of simple chronic hypertrophic middle-ear catarrh with dulness and retraction of the drumhead, and likewise in subacute middle-ear catarrh, in acute otitis media caused by influenza, and the sequelæ of chronic purulent otitis media where by customary treatment an improvement of the subjective noises and the power of hearing could not be obtained. In these cases particularly massage shows itself to be of essential value. It is justifiable to try massage in those cases in which a certain diagnosis could not be made as in them the subjective noises were improved in 40 per cent., and improvement in hearing in 5.7 per cent.

In conclusion I want to repeat my former statement, that in pronounced cases of idiopathic affections of the sound-perceptive apparatus massage, so far as my experience goes, promises no results whatever.

ON OTOGENOUS MENINGITIS.[1]

By Dr. JACOB COHN, of Breslau.

Translated by Dr. H. Knapp.

IN comparison with intracranial complications of inflammatory middle-ear processes, meningitis has, of late, relatively seldom received special attention. The interest of clinicians centres chiefly in those complications of middle-ear inflammation whose curability has been more satisfactory, namely, cerebral abscess and sinus thrombosis. A comprehensive picture of otogenous meningitis has not yet been presented.

Otogenous meningitis mostly follows chronic suppurations in the cavities of the middle ear through direct contact of the diseased portion of the temporal bone with the cerebral meninges, either with or without perforation of the dura. This origin of meningitis is, however, not directly proven when at autopsy we find caries and necrosis of the tegmen tympani with involvement of the dura, for a perforation of the dura may be closed by adhesive inflammation between the dura and pia, and further search will discover that the path of infection leads through the labyrinth. According to our experience, the propagation through the labyrinth is the more frequent either after destruction of the fenestral membranes, perforation of the semi-circular canals by cholesteatoma, carious processes, or by extension of the pyogenic germs along the nerves, aqueducts, and veins into the arachnoid cavity. The labyrinth may be completely shut off from the middle ear and nevertheless transmit the infectious agent to the meninges. On the other hand in many cases the chronic suppuration slowly causes the formation of adhesions which, for a long time, may prevent the entrance of the suppuration into the arachnoid cavity.

---

[1] From the Department for Ear, Nose, and Throat Diseases, in the Hospital of All Saints at Breslau (Dr. Brieger, Executive Surgeon).

It is rare that other preformed channels are followed. Ordinarily the petrosquamous suture in the roof of the tympanum is mentioned among the passageways of tympanic suppuration to the meninges. It is, however, sure that meningitis occurring in the age in which this fissure is present, namely, in the first half-year of life, is so very rare that the propagation of suppuration through this fissure can scarcely be considered. Just as little can we accuse physiological dehiscences as favorable paths for extension of tympanic suppuration.

Another channel in which suppuration can travel from the ear into the brain is the canal of the facial nerve. This possibility should be continually borne in mind, a fact which I beg to exemplify by a case from our own hospital practice.

CASE I.—**Acute purulent otitis media with mastoid involvement. A sequestrum of carious bone of the wall of the facial canal opened the way for the invasion of the meninges. Duration of the disease, seventy-six days. Autopsy.**

Mrs. M., fifty-five years old, presented herself with acute left otitis media and strong involvement of the mastoid process. By antiphlogistic treatment and repeated paracentesis of the drum membrane, she felt relieved at the beginning. After prolonged treatment she stayed away for four weeks. During that time she had intense headaches and lost strength. The otorrhœa continued. At her return she said that four weeks after the beginning of our treatment the disease "had gone into her head." She had opisthotonos, vertigo, fever, and nystagmus when looking to the right.

September 23d.— Great emaciation, temperature 38° C., head freely movable without pain. Horizontal nystagmus while looking forcibly to the right. No other nervous symptoms. Background of eyes normal. Right ear: drumhead dull, grayish-white. Left ear: mastoid process greatly swollen, sensitive to pressure at its base and tip. Region of the mastoid emissary slightly swollen and tender. External meatus filled with creamy, inoffensive pus which, after complete cleansing, reappears quickly. Through the perforation in the lower part of the tympanic membrane swollen mucous membrane protrudes.

September 25th.—Upper and posterior membranous walls distinctly bulging.

Opening of the mastoid.—On the first stroke of the chisel a large quantity of creamy pus escapes. All the cells down to the tip are opened. The whole process is converted into a uniform cavity. Upon opening the antrum a perforation at the roof is noticed. Granulations cover the dura of the middle cranial fossa. Suspecting the presence of an extradural abscess or sinus thrombosis in the posterior cranial fossa, the latter is opened, but is found to be free from abnormalities.

Oct. 2d.—First change of dressing; the wound in good condition. In the further course of the disease a facial paralysis developed which, at the beginning, was scarcely perceptible, but total from October 14th on. The left ear was completely dry. The tympanic membrane is difficult to recognize; it is apparently bulging. Exploratory paracentesis elicits only blood. The retro-auricular wound in full healing process.

Oct. 22d.—Patient complains of stupor, is depressed, and cries without any cause. No other psychical symptoms. Next day, frontal and occipital headache, nausea, tremulousness, and staggering. In the evening, chills, temperature up to 39° C., patient difficult to arouse, answers slowly but correctly. She is mostly dozing. Patellar reflexes exaggerated. Suspecting the presence of a latent cerebral abscess, or the diffusion of a formerly circumscribed meningitis, a lumbar puncture is made with negative result. Under a general anæsthetic the wound is reopened and the antrum broadly exposed also towards the tympanic cavity. In doing so a sequestrum, 1.5 *mm* x 2.5 *mm*, is found in the medial wall of the passageway from the antrum to the attic and is removed. Then the sigmoid sinus is exposed again, its walls being covered with granulations and thickened. An exploratory opening has negative results.

Oct. 23d.—Greater somnolence. Movements of the head painful. Patellar reflexes, left greatly exaggerated, right strong, ankle clonus. Pulse and respiration accelerated.

Oct. 24th.—Pulse scarcely to be felt. Patient constantly in passive decubitus. Background of eyes normal.

Oct. 25th.—Death.

Autopsy.—The dura tight. The sulci of the whole convexity of the brain are filled with a more or less thick layer of pus arranged around the veins of the pia mater. The same condition, but in less degree, is found at the base of the brain. Cerebral substance normal. Ventricles not notably enlarged. Cerebro-spinal fluid muddy ; in the left lateral ventricle, purulent fluid. No thrombi in the sinuses. In the posterior cranial fossa, near the left lateral sinus, a defect in the bone the size of a pea, closed only by membrane, leads into the opening made by the operation. Above this place the bone is superficially eroded in an area 2.5 *cm* in diameter. A probe penetrates into softened and discolored osseous substance in which a complete separation of bone can nowhere be found. In the internal auditory canal purulent secretion around the facial and auditory nerves. Temporal bone : all of the compartments of the middle-ear converted into one uniform cavity ; the defect at the roof of the tympanum is noted ; the dura is covered with granulations ; the facial is exposed through the dehiscence of its external wall.

Remarks.—The cause of the meningitis was a small piece of necrosed bone in the facial canal at the aditus ad antrum ; its removal opened a channel for the propagation of the pyogenic germs to the meninges.

Very rare, but authentically observed, is the propagation of suppuration through the carotid canal. The most careful search in the records of the pathology of the ear may fail to suggest a clue to the pathway by which the suppuration has crept into the arachnoid cavity, a pathway which the most careful autopsy may fail to detect. We have to fall back to extension along the blood or lymph vessels and the nerves. A recent case from our hospital department may serve as an example of this mode of propagation.

CASE 2.—**Acute otitis media ; persistent headache after paracentesis. On 10th day, first symptoms of meningitis ; death on the eleventh. Duration of disease, eleven days. Autopsy : purulent meningitis.**

Patient had acute otitis media without any peculiar features in its course apart from the headache persisting after the paracentesis. On the 10th day the first symptoms of meningitis suddenly appeared. Twenty-four hours later, death. The autopsy demonstrated extensive purulent meningitis. Examination of the temporal bone showed no abnormality apart from the inflammatory changes found in the mucous membrane of the middle-ear cavities except a collection of pus in the cells immediately below the tegmen tympani. The labyrinth was free.

According to Koerner, otogenous leptomeningitis from purulent inflammation of the middle ear is mostly produced by an unperforated resistent tympanic membrane. This statement is supported by several observations.

Traumatism may produce meningitis otogenously, even when the tympanic cavity is free from inflammatory symptoms. In general the drum is germless; occasionally, however, it contains micro-organisms, which probably have entered through the tube. These organisms may remain indefinitely quiet, but by traumatism, with hemorrhages into the drum, they may become virulent and infect with the drum the subarachnoid cavity, as was exemplified by a case reported by Brieger. If this can occur with an intact middle ear, it may do so much easier when the cranial cavity is in communication with the drum. The knowledge of the anatomical localization of the meningitis is of importance to account for the variety of its clinical picture. It has been customary to consider the base of the brain as always being affected; without doubt, this is so in the majority of cases. The observation of disconnected foci of suppuration, found in autopsies, may be explained by the results of lumbar puncture, which show that the suppuration may extend through the whole arachnoid sac. Whether such a discontinuous expansion of meningitis is caused by low virulence of the pyogenic substances, as S. Wolf supposes, is questionable. In our hospital we meet at times with cases of very low chronic suppuration, with relatively slight virulence of the germs, but followed by grave diffuse meningitides.

A very remarkable microscopical examination of the suppuration has been observed by Swain,[1] namely, the location of the suppuration in the **choroid plexus**, resulting from caries of the roof of the drum, without having produced suppuration in the meninges. Involvement of the plexus in diffuse meningitis is frequent. Swain's case of isolated affection of the plexus, which was perhaps only apparent, is unique. The extension to the spinal part of the arachnoid sac is, especially in meningitis of the posterior cranial fossa, mostly macroscopically recognizable. According to Lichtheim, there are no pure cerebral or pure spinal meningitides. The communication of the subarachnoidal spaces makes the transportation of the infectious substance into the cerebro-spinal system a necessity. Occasionally otogenous meningitis is found isolated in the spinal arachnoid sac. In this case the affection in the cerebral part may be slight and circumscribed; whereas in the spinal part it may be developed with great intensity. Spinal meningitis will terminate only after its extension to the cerebrum. A conclusive example of the slow course of spinal meningitis is the following:

---

[1] Four cases of otitis media purulenta with extension into the skull and the back of the neck. ARCH. OF OTOL., xxvi., p. 39, 1897; *Zeitsch. f. Ohr.*, 1897, Bd. 31.

CASE 3.—**Otorrhœa from childhood, fourteen years. Aggravations and remissions, with symptoms of cerebral involvement, simulating hysteria. A number of extensive ear and head operations in several hospitals with negative result, but always followed by temporary relief. Death from cerebro-spinal meningitis. Duration of disease, seventeen years.**

Mr. M., nineteen years old, suffered from ear disease since childhood. He was during the last three years almost constantly under treatment. He complained of pain in the head and back; he had at times fever, with repeated chills and occasionally disturbance of consciousness. During this time he was treated in twelve hospitals, mostly surgically. When he presented himself in Breslau he was feeble, pale, depressed, and timid. His temperament was very changeable, maniacal at times and melancholic at others. He lay in bed, apathetic, and soon after complained of great pain in his back. Behind the right ear there was a granulating wound, 5 *cm* in length. The probe penetrated 2 *cm* inward, evidently into the antrum. Fetid pus was in the ear. The infiltration of the walls of the meatus prevented the recognition of details. His temperature remained permanently at 39° C., pulse 75. To avoid errors from the simulation of hysteria the temperature was taken in the rectum and was found always normal, even at the time when it was considerably elevated in the axilla. Upon inquiry at the hospitals where, on account of diffuse cerebral symptoms, operations for sinus thrombosis and cerebral abscess had been made, we were informed that none of those diseases were ever found. All those operations, however, had been followed by conspicuous improvement, which seemed to confirm our suspicions of the presence of hysteria. In some places the patient had been dismissed on account of disobedience. The local symptoms of the ear and mastoid wound necessitated the exposure of the whole field of operation. After the removal of the granulations the dura and the posterior cranial fossa were freely laid bare. There was distinct pulsation over the dura and also of that of the middle cranial fossa, which made the presence of a cerebral abscess rather improbable. The operation was concluded by an exposure of all the middle-ear cavities. After this operation there was again a remarkable improvement in the condition of the patient. He stated that he scarcely felt pain in his back and head, but that his mental condition was so unsteady that it caused him a great deal of annoyance. In two weeks the spinal pain returned and the patient took permanently to his bed. Not a long while after, the patient complained of intense headache for several hours, became unconscious, and showed the characteristic picture of meningitis. The temperature was, shortly before the onset of the disturbance of consciousness, raised to 40° C. About twenty hours later he died.

Autopsy. — *Cerebro-spinal meningitis from suppuration of the middle ear.* No changes were found in the middle fossæ but the posterior cerebellum was covered with pus. Putrid masses were found most densely in the region of the entrance of the facial and acoustic nerves into the right petrous bone. Meningitis was demonstrable through the whole spinal canal, where it had led to great thickening of the soft meninges. Temporal bone: granulations in several places on the surfaces of the middle-ear cavities; fenestræ, normal; stapes, imbedded in granulations; labyrinth, filled with pus.

Remarks.—The differences between the lesions of spinal and cerebral meningitis support the supposition that the spinal process was of an earlier date. It is quite possible that several attacks ran their course, one after the other, at longer or shorter intervals. It is possible, however, that the adhesions between the dura and pia, found post-mortem in the anterior cranial cavity, have to be referred to previous processes in the cerebral meninges that had run their course. The latency of the spinal meningitis is not surprising if we bear in mind how frequently even cerebral meningitis finishes its course without any symptom. The cerebral phenomena accompanying the successive attacks may not have been produced by aggravations of meningitis, but may have been the expression of inflammatory œdema in certain parts of the arachnoidal sac causing increased transudation of liquor, showing the picture of the disease described under the name "serous meningitis." The different operations accompanied by opening the cranial cavity may have given relief through diminishing the œdema by depletion. The case is an example of the difficulty encountered in making a clinical diagnosis on account of the frequent latency of meningitis. The peculiar psychical alterations led to the error in diagnosis. In other cases similar symptoms may be referred to tangible changes that afterwards will not be found. The variety of the causes of meningitis has been pointed out by earlier authors. The apoplectic type is met with in such otogenous meningitides which are brought about by perforation of a cerebral abscess into the lateral ventricles, or on the surface of the brain. The same course may be noted if uncomplicated pure meningitis follows the acute infections of the tympanic cavity. The following case of otogenous meningitis may serve as a type of this most acute course:

CASE 4.—**Fulminant meningitis from influenza otitis. Pachymeningitis from contact with perforated dura over tegmen tympani, and meningitis propagated through the labyrinth.**

Mr. S. presented himself with acute otitis media dextra following influenza. The great sensibility to pressure over the mastoid region, accompanied with copious suppuration and an intense involvement of the mastoid mucous membrane, did not yield to antiphlogistic treatment. Constant and permanent right-sided headache, exacerbating at night; the further permanent rise of temperature demanded opening of the mastoid. The temperature lower and the headache completely removed. The secretion from the drum disappeared rapidly. The patient was discharged from further treatment. Sometime after the opening of the mastoid intense headache set in suddenly at noon; in the evening the patient was completely unconscious. When he returned in an ambulance the next morning he showed the picture of pronounced meningitis. Lumbar puncture discovered a great deal of albumin, the presence of an immense quantity of pus corpuscles, besides disseminated cocci and bacilli, resembling those of influenza. About twenty hours after the onset of the severe symptoms, death.

The **autopsy** demonstrated *extended virulent meningitis propagated through the internal auditory meatus.* The fresh exudation and the absence of dilatation of the ventricles excludes the longer duration of the inflammatory process which we might suppose to have preceded the acute aggravation. The case shows, also, the remarkable simultaneous occurrence of pachymeningitis from contiguity of the defect in the tegmen tympani and leptomeningitis through propagation of the suppuration through the labyrinth.

Meningitides from chronic middle-ear suppurations have a fulminate course only rarely, namely, when it has been long circumscribed and suddenly becomes generalized.

CASE 5.—**Chronic purulent otitis media. Operation made on account of intense headache, but did not relieve it. Recovery from operative wound progressing nicely. Suddenly meningeal symptoms. Death in twenty hours. Autopsy: Diffuse meningitis, origin and propagation not traceable.**

Only a short time ago a case was observed at our department in which on account of carious processes in the bony walls of the middle-ear cavities, an operation was performed. Intense headache was the immediate cause of the operation but it was not relieved by it. As other symptoms of the propagation of suppuration through the labyrinth and cranial cavity were missing no further interference was resorted to. The recovery from the operative wound progressed nicely. On a sudden meningeal manifestations appeared which ended in death, in the course of twenty hours. The temperature up to the onset of these phenomena had been normal. The autopsy discovered an intact labyrinth and normal osseous surroundings of the middle-ear spaces, and a diffuse meningitis the propagation of which from the ear was doubtless but not exactly traceable.

Just as variable as the course is the picture of disease of otogenous meningitis in its terminal stage, which almost always corresponds to the onset of generalization. Pathognomonic symptoms scarcely ever fail. At the beginning fever is present and at times the well-known pyæmic temperature chart of sinus thrombosis. Retardation of the pulse as an expression of intracranial tension mostly is not very marked. Changes in the background of the eye are at least as often absent as present. Irritation phenomena are most pronounced in the contra-lateral extremities because the hemisphere on the side of the diseased ear is usually most affected. Focal symptoms are frequently noticed at the beginning of meningitis. Aphasic disturbances have been described. Jansen reports a case of optic aphasia which he diagnosticated as due to circumscribed meningitis on the lower surface of the temporal lobe and which was cured by opening the skull. Such symptoms need not always be caused by circumscribed meningitis with inflammation of the adjacent cortical zone of the brain, but only by a temporary suspension of function from transient œdematous infiltration. Cases in support of this statement are on record.

Errors of diagnosis between transient œdema, meningitis, and abscess will continue to be made. Not only all symptoms of destruction or irritation but cerebral symptoms in general may be present in otogenous meningitis. In some cases disturbances of general health are prevailing and not infrequently mislead us to confound meningitis with typhoid fever. Lumbar puncture may clear up the diagnosis. Opisthotonos is present not only in meningitis but may be so in all inflammatory processes in the posterior cranial fossa, *e.g.*, cerebellar abscess and extradural accumulation of pus. Still more indefinite are the symptoms of spinal meningitis. Its occurrence in otorrhœa is demonstrated by observations of Abercrombie, Lichthein, Jansen, and others. Oppenheim details the symptoms of pure spinal meningitis as follows:

"Rigidity of the muscles of the trunk and extremities with great exaggeration of the mechanical muscular excitability and tendon phenomena (exaggeration of the knee jerk and foot tremulousness), hyperæsthesia of the skin and soft parts at the trunk and extremities, back phenomena (inward curvature of the vertebral column on pressure and beating of the back), disturbance of the function of the bladder and rectum, girdle-pains, and finally paraplegia and loss of the knee jerk."

Considering what has been said, it is evident that the clinical diagnosis of otogenous meningitis is often impossible. Lumbar puncture is the only means of recognizing it distinctly. The diagnosis is sure if lumbar puncture demonstrates, by microscopic and chemical examinations, pus in the cerebro-spinal fluid. The culture experiments are less reliable for they may be negative in undoubtable cases of meningitis. Lumbar puncture will furnish the proof that cases of true meningitis may be recovered from. The curability of circumscribed meningitis is established by several observers in which the autopsy *in vivo*, the operation, demonstrated the presence of circumscribed foci of the pia mater. If otogenous meningitis is only apparently diffuse, a collateral œdema, producing the symptoms of general meningitis, will of course disappear by the elimination of the circumscribed suppuration in the arachnoidal sac. Perhaps the number of observations of meningitis serosa in ear disease may be explained in the same manner. An example in point may be reported:

CASE 6.—Epidural abscess evacuated by mastoid operation. Transient relief. Marked cerebral symptoms. Reopening of the wound. Dural flap. Two punctures of the brain, no pus, but abundant discharge of cerebral fluid. Permanent recovery.

A girl of eighteen years, of healthy family, without previous disease, was taken with hoarseness and pain in the throat two weeks before admission. She suffered from a peculiar whitish coating of the pharyngeal tonsil which disappeared in two days, probably angina of the pharyngeal tonsil. Then furunculosis of the right, and soon after of the left, ear set in. Subsequent otitis media necessitated paracentesis of both drumheads. Left ear: meatal walls red, swollen, covered with dry secretion; mastoid tender on pressure; posterior half of the drumhead very red and bulging. Right ear: The drumhead was red, bulging, and perforated; otorrhœa. The left ear gradually improves; the right continues to discharge pus and to be tender on pressure over the mastoid. Aggravation of the symptoms with intense headache demanded the **opening of the right mastoid process.** The antrum was very small, the mastoid process but little developed, and an extensive extradural collection of pus was found in the middle cranial fossa communicating with the middle ear through a defect in the roof of the antrum. The patient improved, was discharged from the hospital to be treated as an out-patient. She had, however, soon to be readmitted on account of the presence of fever and increase of headache. A gradual paralysis of the right external rectus, slight stiffness of the neck, and a rapidly increasing optic neuritis made their appearance. Her mental faculties were disturbed. A rapidly progressing acute encephalitis seemed to be the most probable diagnosis. The **operation wound was,** therefore, **reopened,** the dura broadly exposed, and a dural flap from the middle fossa was laid back, the brain punctured, and, as this gave negative results, two exploratory incisions were made. The cerebral fluid escaped abundantly. The cerebral substance on section appeared somewhat œdematous. After the operation her mental faculties were soon restored, the temperature sank from 39.6 ° C to 37 ° C in several hours, and remained there. The wound behind the ear gradually closed. The drumhead had a right perforation in the posterior lower quadrant. Paralysis of the right abducens persisted. She occasionally had headache ; no fever ; pulse irregular from 100 to 108 ; general condition good ; changes in the background of the eyes gradually disappeared ; more slowly the paralysis of the abducens. The duration of the disease was three months.

Diffuse meningitis has, from the first, been considered incurable. In opposition to this belief are chiefly the observations of Macewen, who had six recoveries in twelve cases operated upon for meningitis. Unfortunately these cases are not reported in detail, and no lumbar puncture was made, so that it is not certain whether he had to deal with pure diffuse meningitis. In a case of Brieger's, which will be published later at another place, the recovery was unquestionably demonstrated. Recovery was obtained by the stamping out of the pus focus in the middle and inner ears after lumbar puncture had established the presence of meningitis. Lumbar puncture, which has been made in our hospital in all cases of supposed meningitis, almost invariably was followed by the relief of the patients. It is without danger. Recoveries of such otogenous meningitides will, after all, always be exceptional. Therefore we can only repeat the general dictum, prophylaxis against extension of otitis to the meninges is the most important measure. Even to-day it is not out of place to reiterate the self-evident rule that every case of otorrhœa should be cured either by conservative or operative treatment. I should not, however, omit to mention that it is not possible in every case to attain this object.

RETROPHARYNGEAL ABSCESSES AFTER OTITIS MEDIA PURULENTA.

BY DR. GEORGE KIEN, STRASSBURG.

Translated and Abridged[1] by Dr. J. A. SPALDING, Portland, Me.

WHILST gravitation abscesses in the neck from otitis media are not uncommon, retropharyngeal abscesses from the same cause are rarities in practice.[2] Having lately seen four new cases of this affection, I take this occasion to report them in brief, together with some remarks on the origin, symptoms, diagnosis, and treatment. Simple cervical gravitation abscesses, which generally originate simultaneously with the retropharyngeal variety, have been so fully described by De Quervain[3] that I need not mention them in this paper.

CASE 1.—Sophie S., æt. forty-seven, October 15, 1896. Acute otitis externa in left ear with a small peritonsillar abscess and a history of forty years of otorrhœa. *Mt* invisible from contraction of the meatus. Boroglyceride and Priessnitz fomentations into the ear and about the neck. The abscess on the left pharyngeal wall was evacuated, but the patient soon returned with abundant discharge from the ear and a large fluctuating abscess gravitating half-way down the neck. Pressure caused pus to well from the ear. Mastoid swollen, infiltrated, and painful; dysphagia, headache, sleeplessness, and feverishness. Mucosa of pharynx, left tonsil, and uvula swollen and red. Pressure on left pharyngeal wall drives pus from the left meatus.

---

[1] From vol. xxxix., p. 73, 1901, Germ. Ed.

[2] In the entire series of these ARCHIVES, for instance, I have found but one case, and that reported by H. Knapp, vol. xxiv., p. 121. See also two cases by Marton and Melzi, *Annals of Otology*, vol. ix., pp. 216, 217.—TRANS.

[3] *Semaine médicale.*, 1897, p. 133.

Operation, Oct. 20th.—Nothing abnormal in upper part of mastoid, but the tip carious, and had to be removed. Then the radical operation. Granulations abundant. From the necrotic tendon of the sterno-cleido-mastoid, extends downward a large cavity filled with pus and necrosed tissue, and reaches the border of the trapezius, where a counter-opening was made from the outside. Furthermore, this cavity communicated broadly, internally, with the abscess on the inner pharyngeal wall. Palpation showed nothing but mucous membrane between this and the pharynx wall. The cavity was evacuated, scraped, and filled with iodoform gauze. Complete left facial paralysis at once ensued, with high temperature and rapid pulse, anæmia, and profuse perspiration.

A week later putrid bronchitis came on with crepitation and râles and lasted several days. No secretion followed thoracic puncture. Dressings of the abscess were changed daily and much purulent secretion was removed. By the middle of November slight putrid bronchitis, with crepitation and dulness high up in the thorax. The abscess-secretion daily diminished, and drainage from the cervical incision was omitted. Patient was discharged in December, reporting occasionally for change of dressing. The left facial paralysis remained permanent; the abscess cavity finally granulated and closed so that an ultimate cure was reached at the end of one year of treatment. The walls of the meatus seemed totally adherent to one another.

CASE 2.—Karl D., æt. twenty, suffered for three days with discharge and pain and deafness in A D. A physician had syringed a large amount of cerumen from this ear a few days before.

Aug. 20th.—Small perforation in A D, and abundant suppuration. This ceased rapidly after carbolated glycerine, but he returned Sept. 8th with bulging of *Mt*; profuse suppuration, and mastoid symptoms. Sept. 11th, the mastoid was opened, moderate pus discovered and granulations. Iodoform gauze. Three days later temperature was 38° C. (100° F.), and he complained of pain in the joints, particularly in the right hip. He improved slowly till about Sept. 30th, when infiltration came on in the mastoid incision, pain in the right cervical region, dysphagia, and temperature so high that a second operation was done. The mastoid cavity was enlarged, granulations scraped, and apparently solid bone chiselled away towards the occiput. The sinus was laid open to view, and as its wall looked discolored though pulsating, puncture was made, letting off only blood. Then the sinus was split open more widely, a step followed by profuse hemorrhage but no signs of thrombus. Iodoform tampon.

A second profuse hemorrhage occurred a few days later when changing the dressing; the temperature still remained very high, dysphagia came on and persisted, the right and posterior pharyngeal walls were much protruded, and an incision as deep as possible in this region let off pus, so that the dysphagia ceased the same day. Before the end of a week the entire condition of the sinus, antrum, and pharynx improved progressively, although the region over the sterno-cleido-mastoid was still tender, and the night temperature slightly elevated.

Dysphagia reappeared in October, with high temperature and pain, but after reopening the abscess cavity, as before, pus once more escaped. After this the patient made a rapid and uninterrupted recovery.

Case 3.—Augusta, æt. fifty-six, had suffered for several months from influenza-pains in A D, for two months with deafness, tinnitus, and occasional vomiting without fever.

March 11, 1900.—Small cicatrix in left *Mt.* Right ear: narrow meatus, infiltration in *Mt*, no pressure-pain over tip of mastoid, but pain over the base. A S, whisper. A D, profound deafness T-F tests show loss of perception for c 32, c 64, and C in A D, but all tests perfect in A S. Weber right. Schwabach right + 4. Venous congestion of retina O D. The case was diagnosticated as perisinuous abscess.

March 15th.—The operation revealed normal bone down to antrum, but from there abundant pus escaped under pressure. The antrum was enlarged as much as possible, and the sinus exposed for ½ *cm.*, but no granulations or pus discovered.

Up to March 18th no fever or pain, but that night sudden pain in the neck, dysphagia, hard, painful infiltration on the outer surface of right neck, and internally on the lateral pharyngeal wall and in the right tonsil. Slight trismus. Late at night the patient evacuated blood and pus from the throat with great relief to the dysphagia. On the next day pus was seen at the floor of the antrum, and pressure upon the infiltrated surface in the neck caused more to well up. A second operation was now done in which the tip and entire lower portion of the mastoid were removed. Beneath the horizontal sinus we reached a large cavity containing pus and granulations and extending downward like a deep pocket as far as the mucosa of the pharynx. This was enlarged, scraped, and packed with iodoform gauze. Nothing interrupted from this time on a complete recovery.

CASE 4.—Wilhelmina æt. eight. Nov. 11, 1897. Paracentesis of *Mt*, A S, for acute otitis media. This was followed by high fever, trismus, dysphagia, and pain in the neck. Owing to the trismus, examination of the pharynx was difficult, but there was no doubt of redness and swelling of left pharyngeal wall. Spontaneous evacuation the same night of a mouthful of blood and pus. The left tonsil showed the next morning a cavity from which the pus had escaped. The trismus, soon improved, but mastoid symptoms demanded an operation on the antrum, which was found full of pus and granulations. At the bottom of the antrum was a fistula from which pus escaped on pressure below, and on following this we reached a pocket extending down to the pharyngeal mucosa. Pressure on the left pharyngeal wall through the mouth caused pus to ooze from the antral fistula. The fistula was enlarged, the pus pocket scraped and tamponed as usual. Recovery soon followed.

A brief review of these cases shows in Case 1 a *chronic middle-ear suppuration* lately growing worse, profuse discharge from A S, and an abscess extending from the insertion of the sterno-cleido to the middle of the neck. The entire pharynx was bulged forward. *Pressure there as well as on the abscess in the neck extruded pus from the ear.* The abscess was opened, and a broad communication established between it and that in the pharynx. Six days later *purulent pneumonia* set in but gradually disappeared.

Case 2 was one of *acute purulent otitis* A D, with profuse suppuration, and *pain in the mastoid.* Operation. Four days later *the temperature rose* and remained high for ten days, when dysphagia was complained of. The temperature remaining high, we suspected sinus thrombosis and *split the discolored sinus*, an operation followed with profuse hemorrhage. Nevertheless, the fever remained high and pain in the right cervical region continued. Eight days later *the pharynx bulged excessively ;* in a short time an abscess pointed, was opened, and the patient was soon cured.

Case 3 was a *subacute purulent otitis with a perisinuous abscess.* The sinus was exposed. There was no pus in the antrum, but some escaped from the posterior cranial fossa. Three days later there were symptoms of *retropharyngeal abscess:* moderate fever, bulging of the pharyngeal wall, dysphagia, and painful infiltration in the neck. *Pressure on this region drove much pus from the bony cavity.* The second operation consisted in removing the entire tip of the mastoid. Below this we reached a pus pocket extending beneath the pharyngeal mucosa, opened and cleansed it, and cure was gradually complete.

Case 4 offers the picture of *acute otitis media purulenta* with all the symptoms of retropharyngeal abscess, the antrum was filled with pus and granulations, and *a fistula* reached down from the antrum to the pharyngeal mucosa. In this case too recovery was finally obtained.

The *cause* of these retropharyngeal abscesses was purulent otitis. Formerly, such abscesses were supposed to depend on injuries of the pharynx and œsophagus, when inflammatory irritating agents penetrated the space, filled with loose connective tissue, which spreads out between the spinal column and the pharynx. This region is consequently of great importance, reaching from the base of the skull to the thorax. At the level of the cricoid cartilage it is more narrow and surrounds the œsophagus. In front it is well enclosed on every side, but below, near the inferior thyroid artery, a communication exists with the thorax. In addition to pharyngeal traumatisms we find, as causes of retropharyngeal abscesses, caries of the superior cervical vertebræ, and, in the opinion of Bokai,[1] affections of the retropharyngeal lymphatics, which bring to this district discharges from the palate and pharynx, especially with pus-foci in their neighborhood. Resorption of pus into the lymphatics, and thence into the pharyngeal glands, is plausible, as in a case reported by Weil.[2]

To such causes we must now add *otitis media suppurativa both acute and chronic.* Bezold,[3] is inclined to include only the acute form in the ætiology of these abscesses, but my first case proves that an abscess may occur in the chronic form of otitis purulenta. Schwartze and Hartmann,[1] mention neoplastic bone-formation in chronic otitis, occluding the cells and diploë of the tip and inner wall of the mastoid. Such a condition may account, in their opinion, for *unusual extension* of pus in chronic suppurative otitis.

---

[1] Koenig, *Spec. Chirurgie*, Band i., p. 250.

[2] "Aetiologie d. Retropharyngealabscesse," *M. f. Ohr.*, 1881, No. 3.

[3] *Deutsch. med. Woch.*, 1881, July 9th.

When pus is once occluded in the middle ear it strives to make its way out, first from the tympanum to the antrum and mastoid cells, which is the easiest way as both have the same mucosa. If occlusion persists, either because the *Mt* is still intact, or because it has closed too rapidly after perforation, or because the perforation is too small or has been closed by granulations, then the pus tries to escape through the bone itself, or along any preformed bony openings. The pus may escape upward through the tegmen, as in Kessell's cases,[2] and then enter the middle or posterior cranial fossa, from which it can escape through the foramen rotundum or ovale. It may also make an exit from the posterior cranial fossa through the foramen jugulare, extend from there backward to the attachment of the short deep cervical muscles, and forward along the basilar bone of the occiput to the anterior side of the spinal column as far as the level of the epiglottis, where the retropharyngeal space becomes narrow. If such a course is taken, we get paralytic symptoms of the affected nerves in the foramen, as in Kessell's case in which total paralysis of the tongue, dyspnœa, aphonia, and rapid pulse were observed.

The direct paths *downward* are, however, more frequent in the causation of retropharyngeal abscess than the rupture of pus through the tegmen tympani. When it does not so break forth, it can descend through the floor of the antrum, or along the anterior wall of the meatus, avoiding or not the maxillary articulation, or through the posterior antral wall into the posterior cranial fossa and from there downward. Bezold thinks that pus escapes most often from the medial side of the mastoid because the bone is thinnest there.

The paths along which the inflammatory process extends may be partly preformed(vascular channels),partly neoplastic, or they may represent neoplastic perforations from bony absorption. It is generally impossible to decide this point when the communication between the primary and secondary focus has attained any size. This we found so in Cases 3 and 4, in which direct communication with the abscess from the primary bony focus was easily discovered, for pressure on the pharyngeal wall forced pus from the fistula, a sure sign of communication between the retropharyngeal space and the bony cavity.

---

[1] Schwartze, *Lehrbuch*, Band ii., p. 328.

[2] "Otitis Interna. *Inaug. Diss.*, Giessen, 1896.

The occipito-mastoid suture may favor extension of puss especially when, according to De Quervain,[1] the mastoid cells reach as far back as the suture and occiput.

Finally, if the Eustachian tube is occluded, as suggested by Haug,[2] the pus may escape through the anterior wall of the tympanum, through the peritubal tissues, the canal of the tensor tymp. playing the part of a conductor of infection between the middle ear and pharynx.

The course of the abscess depends on the permeability of the fistula and the amount of pus. In acute cases, it may develop rapidly with fever, trismus, and violent pain in the neck. In chronic otitis the abscess generally forms slowly, increased temperature being long observed without pharyngeal symptoms. These may, however, be so marked from the start that, as in Case 2, we wrongly diagnosticated sinus thrombosis. Even after opening the sinus the temperature kept high until the true cause, the abscess, came to light. After the operation the temperature fell. Therefore, our first operation, though not unjustified by the symptoms, was superfluous.

These abscesses generally confine themselves to the space between the spinal column and the pharynx. They rarely descend below the top of the cricoid cartilage because the space is narrow there. It is doubtful if pus escapes into the thorax in the region of the inferior thyroid artery. In three of our cases (2, 3, and 4) the pus collected only in the retropharyngeal space; in the fourth (Case 1) the gravitation abscess lay behind the sterno-cleido-mastoid, arising near its insertion, extending to the trapezius, and reaching the lower half of the neck. The cavity communicated with the abscess on the pharyngeal wall, and pressure upon it drove pus from the ear. This case agrees with others described by Gruber,[1] Rossi,[2] and Haug,[3] only that the abscess gravitated down to the clavicle. If no such excessive extension occurred in my case, it was probably due to the broad communication with the middle ear. Cholewa[4] says that gravitation abscesses from the middle-ear suppuration may evacuate spontaneously, the pus retreating into the middle ear along its original path, owing to broad communication with the middle ear as well as a large perforation of the *Mt* favoring such an escape.

---

[1] *Semaine médicale*, 1897, p. 134.

[2] "Senkungsabscesse," *A. f. Ohrenhlkde.*, 1897.

Case 1 was interesting from its complication with gangrenous pneumonia, probably from rupture of the abscess into the larynx. Although this could not be proved, it was possible despite scraping of the cavity. For, if the operation did not go deep enough, pus would have remained behind, and later made its escape as suggested.

Such complications have before been observed, for Thiry[5] describes a retropharyngeal abscess after otitis, in which the autopsy demonstrated death from pulmonary gangrene. A fistula behind the sterno-cleido extended to the clavicle, communicated with the interior of the larynx, and rupture through this had excited putrid bronchitis.

The *diagnosis* of such abscesses is easy so soon as the pharyngeal wall bulges, fluctuates to pressure; when dysphagia is present, and when pressure on the external cervical region causes pus to well up from the meatus. De Rossi was the first to call attention to this latter symptom. The diagnosis is more difficult in the formative state, the abscess coming on with increased temperature alone.

Phlegmonous angina can only be suspected when the tonsils are coated and where general constitutional infection beginning with angina can be established.

---

[1] "Abscesse i. d. Umgebung. d. Gehoergang," *Oest. Z. f. prakt Heilkde.*

[2] *Archiv f. Otol.*, xxviii., p. 209.

[3] *Archiv f. Ohr.*, xl.

[4] *Deutsch. med. Wochensch.*, "Eiterdurchbruch an auessergewoehnlichen Stellen."

[5] *Zeitsch. f. Ohrenhlkde.*, xx., p. 77.

Retropharyngeal abscesses may produce serious disturbances. The trismus prevents free opening of the mouth, and swallowing is very difficult, and occasionally impossible, owing to the bulging of the pharyngeal walls. The pain in the neck may be very violent. In severe cases the patient holds his head as far back as possible, because every attempt to bring it forward increases the need for breath. Only in the upright position, with backward bent head, can respiration be freely accomplished.

If retropharyngeal abscesses are not opened or do not evacuate spontaneously, suffocation may follow from compression of the trachea or sudden escape of pus into the larynx.

Gravitation abscesses extending to the mediastinum have been seen in cases treated inefficiently or too late. Koenig thinks that death may ensue despite a proper opening if the abscess lies beneath the cricoid cartilage; in other words, so deep that it cannot be reached by the knife from the inside. With such location, the external incision is imperative. So too, in his opinion,[1] the external opening is indicated in every case of retropharyngeal abscess as the only safe way to avoid infection, which so easily in the case of all pharyngeal wounds complicates and retards discovery. He makes the incision on the outside of the neck on a level with the inferior thyroid artery, if the tumor has gravitated so far, and believes, from Burckhardt's experience, that an external opening is indicated even when the phlegmon has not extended beyond the retropharyngeal space. Open along the inner margin of the sterno-cleido, on a level with the larynx, at the inner side of the thyroid vessels, keeping close to the larynx until we reach the medial side of the carotid, where we come down on the connective tissue of the pharyngeal space. Having made the abscess cavity accessible, we enlarge it with strong forceps, scrape it clean, and plug with iodoform gauze.

Chiene makes the incision along the posterior margin of the sterno-cleido, and enters the abscess cavity from the anterior wall of the spinal column.

---

[1] *Specielle Chirurgie*, Band i., p. 523.

If a fistula is already present in the pharynx, if the abscess is not too large, if there seems to be the least possibility of working from the mastoid opening without running the risk of excessive gravitation or retention, it is sufficient, as these cases show, to make a broad communication between the abscess and the mastoid opening, and to conduct the after-treatment from this opening.

THROMBO-PHLEBITIS OF THE SUPERIOR LONGITUDINAL SINUS FOLLOWING INFLAMMATION OF THE FRONTAL SINUS.

By Professor G. KILLIAN, Freiburg i. Br.

(*With six illustrations on Plates VIII. and IX., Zeitschrift für Ohrenheilkunde Vol. XXXVII.*)

Translated by Dr. Arnold Knapp, New York.

THE superior longitudinal sinus enters into close relation to both frontal sinuses. Its anterior, narrow extremity extends down to the foramen cœcum (Fig. 1). Zuckerkandl has demonstrated a direct vascular communication between certain areas of the mucous lining of the frontal sinuses and the superior longitudinal sinus. If the latter be injected, the injection enters numerous small, osseous veins and corresponding areas of the lining mucous membrane of the frontal sinuses. Thus inflammations may extend by thrombo-phlebitis from these areas to the superior longitudinal sinus.

Certain published cases have furnished proof of this and demonstrated that the character of a frontal sinusitis with this complication is a peculiar one and one depending upon a particularly virulent infection. In *Heymann's Handbuch* I have described this variety of sinusitis and have given it the name of sinusitis exulcerans atque abscedens.

The symptoms produced by an infection of the superior longitudinal sinus are peculiar and most interesting. To understand them clearly it is necessary to bear in mind the picture of all the venous tributaries of this sinus.

The anterior tributary regions of this venous channel are situated externally in the mucous membrane of the frontal sinuses and the lateral and median parts of the nasal mucous membrane where the ethmoidal veins originate. Zuckerkandl was the first to describe a vein coming from the anterior, lateral, and superior parts of the nasal mucous membrane (agger nasi) (Fig. 2), which, accompanied by a branch of the anterior ethmoidal artery, enters the cranial cavity through the lamina cribrosa. There it either empties into the venous system of the olfactory tract, or directly into a larger vein of the orbital lobe of the brain (Fig. 3), which joins the superior longitudinal sinus.

Venous blood from the frontal bone communicates with the anterior part of the longitudinal sinus through the frontal diploëtic veins (Fig. 4), which anastomose with the external frontal vein (Fig. 5). This sinus in its farther course collects the blood from the veins which pass over the hemispheres (Fig. 6); in addition a number of veins from the dura mater also join it. Finally it should not be forgotten that there is an opening in the parietal bone by which the superior longitudinal sinus communicates with the veins of the parietal region of the scalp (Fig. 5) through the parietal emissary (Santorini).

A phlebitis may extend from the sinus to any of these veins causing a most complex clinical picture. The clinical material is small; there are only five cases on record, namely: those of CARVER, *British Medical Journal*, 1883, June 16; MACEWEN and MILLER, Macewen's *Pyogenic Diseases of the Brain;* L. MÜLLER, *Wiener klinische Wochenschrift*, 1895, page 194; E. FRAENKEL, *Virchow's Archiv*, vol. cxliii., page 80; and ROTH, *Wiener klinische Wochenschrift*, 1899, No. 14, page 383.

In *Fränkel's* communication, it is briefly stated that, following chronic purulent sinusitis, a thrombo-phlebitis developed with consecutive pyæmia, which was made clear at autopsy.

Macewen and *Miller's* case is that of a young girl who became ill and died after a chronic purulent frontal sinusitis, where the left frontal sinus had been operated upon, with the symptoms of severe general infection—remittent fever, splenic tumor, lung complications, and an abscess of the frontal bone. According to the autopsy report, the cranial walls of the frontal sinus were not carious, nevertheless an extradural abscess was found in the adjoining area, and intradurally there was a purulent membrane on the surface of the brain extending to the median line. The superior longitudinal sinus contained pus. The lateral sinuses were not thrombosed. The left lung contained two wedge-shaped infarcts surrounded by a yellow area of softening, and there were fresh pleuritic changes on the left side. The spleen was enlarged, hyperæmic, and softened.

In this case, a phlebitis of the veins leading to the longitudinal sinus was produced by disease of one or both of the chronically inflamed frontal sinuses. This phlebitis extended to the longitudinal sinus and the veins which join it in its anterior extremity. The extradural abscess presumably originated from involvement of the frontal dural vein, the intradural purulent membrane of the brain was caused by disease of the frontal vein on the surface of the brain, and the subperiosteal abscess on the external surface of the frontal bone is an evidence of the extension of the disease along the frontal diploëtic veins.

In addition to these local changes there were the well-known symptoms of pyæmia and embolism of several branches of the pulmonary artery.

The case of Roth can be explained by very much the same course of deduction. A man, thirty-nine years old, suffered from nasal polypi and continuous frontal headache for three months. The bilateral frontal sinusitis, confirmed at autopsy, must have existed for a long time. A bilateral, slight chronic œdema of the upper eyelid is an evidence of the tendency of an inflammation to extend to the neighboring structures of the sinus. An abscess as large as a hen's egg developed in the middle of the forehead between the two frontal tuberosities. The thrombo-phlebitis of the superior longitudinal sinus must have preceded this and the inflammation extended by means of the frontal diploëtic veins to the frontal vein. The severe cerebral symptoms which led to the patient's death on the fourth day show that the other intracranial changes found at operation and autopsy must have been in full development. An extradural abscess containing 2 *cc* of pus and communicating by three fine perforations in the frontal bone with the extradural abscess was also the result of involvement of the frontal diploëtic veins. Finally, the bilateral purulent meningitis of the convexity was secondary to an extension of the disease through the superior longitudinal sinus to the superficial cerebral veins.

At the autopsy an area of encephalitis was found in the substance of the frontal lobe on the right side. On the left side there was an abscess. It is interesting to ask whether these conditions were caused by a direct extension of the frontal-sinus affection or secondary to the involvement of the superior longitudinal sinus. I am inclined to the latter view as the cranial walls of the frontal sinus showed no changes. The symmetry and bilateral occurrence of these foci are also very striking. It seems to me that the infection travelled through the superior longitudinal sinus and the vascular communication with the orbital lobe as described by Zuckerkandl. Unfortunately a report of the location of the intracranial focus in the frontal lobe is wanting. It would be well worth while to pay special attention to this relation in future cases.

Thrombo-phlebitis of the longitudinal sinus produces characteristic secondary pathological changes. After these have become clear to us the interpretation of Müller's case presents no difficulties. It is a typical picture of the disease in question. The suppurations in typical localities must have been caused by disease of the superior longitudinal sinus, though the autopsy report does not mention a thrombophlebitis of this sinus and the case had been interpreted in a different way by the pathologist.

The patient suffered with an acute influenzal sinusitis of the frontal cavities and an abscess presented over the left parietal bone which was discovered and incised on the thirteenth day; it contained a large quantity of fetid pus and had exposed the bone. On the fifty-eighth day another incision was necessary. A hole was then found in the parietal bone filled with granulations, leading into an extensive intracranial, extradural purulent cavity limited by thickened and discolored dura. This hole was the parietal foramen, transmitting the emissary vein of Santorini, to which the inflammation had extended from the superior longitudinal sinus. This had probably taken place even before the sixth day of the disease, because at that time a swelling was detected in the region of the ear in connection with the superficial temporal vein (a vein which communicates with this emissary). This swelling led to an abscess which was incised. On the sixth day a swelling of the left frontal region was reported which later covered the entire left half of the skull. It is not stated whether a circumscribed abscess was here formed, so that it is impossible to say definitely if this swelling on the left frontal region was secondary to the longitudinal sinus affection or to the orbital process.

I consider the right-sided meningitis of the convexity which appeared toward the end of the disease, another evidence of the rôle which the thrombo-phlebitis of the superior longitudinal sinus must have played in this case.

From the thirty-fifth day on, we have joined to these local signs, pyæmic appearances in the form of rigors. The sinusitis was complicated at the beginning by inflammatory swelling of the orbital tissue and of the lids which seemed to have been caused by the extension of the disease to the recess in the orbital roof which communicated with the frontal sinus by means of a small opening, as was seen at the time of operation. The opening was closed by granulations. At the operation pus was found in the subdural space in the region of the frontal sinus.

In Carver's case an orbital periostitis and abscess complicated the case and seemed the cause of the preponderating symptoms. This had developed in the course of a chronic purulent sinusitis with acute exacerbations. It is interesting to note that the patient, as early as the third day, complained of pain on the top of his head, and that on the fourth and last days distinct meningeal symptoms appeared. This meningitis extended over the entire brain surface, as was shown at autopsy, all of the brain convolutions being covered with pus.

Without doubt the meningitis of the convexity was caused by disease of the superficial cerebral veins secondary to affection of the superior longitudinal sinus. The latter was found filled with a dirty, grayish pus.

In the autopsy report it is stated that the dura over the middle of the orbital roof was thickened, adherent, and necrotic. To my mind, however, this is not sufficient to account for this meningitis evenly distributed over the hemispheres.

If we review the pathological changes in these five cases, we find that a thrombo-phlebitis of the superior longitudinal sinus with a series of other complications may follow a chronic (four cases), rarely an acute (one case), purulent inflammation of one or of both frontal sinuses.

The symptoms may be local or general; the latter are of a pyæmic character and were present in two of the five cases.

The local changes can be divided into intra- and extracranial. The extracranial were not present in every case, and when so are in direct communication with the intracranial changes (extradural changes). They occur as subperiosteal abscesses situated over the frontal and parietal bones. Perforations in the bone show their origin.

The intracranial changes may develop within or without the dural cavity. The former—that is, the abscess—will here be situated below the frontal and parietal bones and may be overlooked (Carver).

The intradural changes are present in every case and lead to death, through circumscribed, one- or double-sided purulent meningitis of the convexity. In addition there may be symmetrically situated inflammatory foci in the frontal lobes. The superior longitudinal sinus was generally found to contain pus at autopsy. The extension of the phlebitis to the transverse sinus was only observed in one case.

The symptomatology of thrombo-phlebitis of the superior longitudinal sinus cannot be given from these five case-histories. It seems, however, that this affection does not produce severe brain symptoms up to the time of the onset of the meningitis. In the cases of Carver, Müller, and Roth, meningeal symptoms did not appear earlier than the second, third, or fourth day before death. Müller's case especially confirms our view, because it can be definitely decided from the characteristic pathological processes that the thrombo-phlebitis had set in on the sixth day. The vomiting and headache which were present after the onset of the pyæmia (thirty-fifth day) were caused by an extradural abscess under the parietal bone. The thrombo-phlebitis in this case must have existed fifty days without causing severe brain symptoms.

The cases of Roth and Carver took such a rapid course that they are of very little use to us. The entire period of observation was two and four days. In the first case the meningitis had already appeared, and in the second only one day intervened before its onset. On this day the patient's sensorium was entirely clear, with a temperature of 109° and a pulse of 120.

Though inflammation of the superior longitudinal sinus does not produce severe brain symptoms, it is not, however, entirely without symptoms. I am very much inclined to regard as an expression of sinus affection the pains in the parietal region, of which Carver's patient complained, especially as in Müller's case a heavy, severe pain in the parietal region was associated with that of the frontal region.

Thrombo-phlebitis of the superior longitudinal sinus after frontal sinusitis may be divided into the following stages:

1. The prodromal stage: symptoms of sinusitis, fever, severe frontal headache.
2. The initial stage: pain in the parietal region.
3. Stage of regional abscesses (the disease has not become generalized): clinical appearances varying according to the site of the extra- or intracranial abscess and the presence with the latter of general brain symptoms.
4. Pyæmic stage: rigors, remittent fever, pulmonary complications, splenic tumor, etc.
5. Terminal stage: meningeal symptoms developing after one to four days.

The terminal stage may follow directly on the initial stage (fulminating course). Stages 3 and 4 may appear simultaneously.

As regards the diagnosis, it would be of the greatest aid to our therapeutic measures if the initial stage gave us some characteristic signs of the involvement of the superior longitudinal sinus. Perhaps well-observed cases will furnish us in the future with other diagnostic signs than parietal pain.[1]

The diagnosis can be made in the stage of regional abscess, if the latter is situated extracranially. As long as intracranial suppurations exist, the presence of the intracranial complications can only be presumed by the general brain symptoms.

The differential diagnosis between an abscess originating directly from a diseased frontal sinus and indirectly by means of the superior longitudinal sinus, and meningitis, can only be made after opening the skull and by making a diagnostic puncture of the sinus.

The pyæmic symptoms are directly referable to this sinus. The meningitis can originate independent of the latter. A rapid case can only be explained at autopsy.

It is very important that, in all autopsies on persons dying of intracranial complications after a frontal sinusitis, the superior longitudinal sinus be carefully examined. If the latter is found diseased, all of the veins leading to the various abscesses must be also carefully investigated.

The treatment is analogous to that of thrombo-phlebitis of the transverse sinus after suppurations of the middle ear. Before the onset of a diffuse purulent meningitis, recovery without operative exposure and resection of the superior longitudinal sinus does not seem to be absolutely improbable, but the chances are very much more unfavorable on account of the intimate relations of the vessels of the brain with this sinus.

Description of Figures on the Plates VIII. and IX.

Fig. 1.—After Poirier.

S. l. s., superior longitudinal sinus.
S. fr., frontal sinus.

---

[1] In thrombosis of the superior longitudinal sinus from other causes, epistaxis and œdema of the scalp have often been observed.

Fig. 2.—After Poirier.
  Art. ethm. ant., anterior ethmoidal artery.
Fig. 3.—After Breschet. Veins of the orbital lobe of the brain.
Fig. 4.—After Breschet. V. d. f., frontal diploëtic vein.
Fig. 5.—Veins of the scalp.
  V. fr., frontal vein.
  L. d. f. p., site of the parietal foramen.
Fig. 6.—After Poirier. Superficial cerebral veins.

Fig. 1.

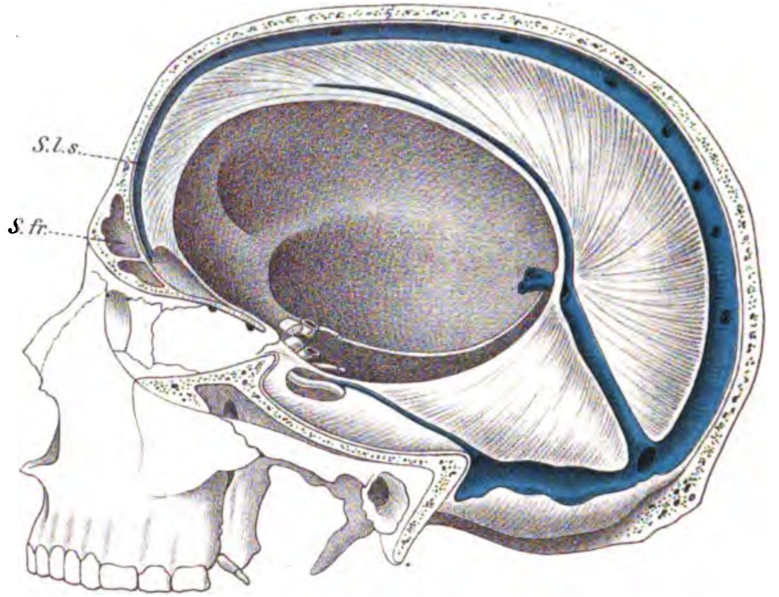


Fig. 6.

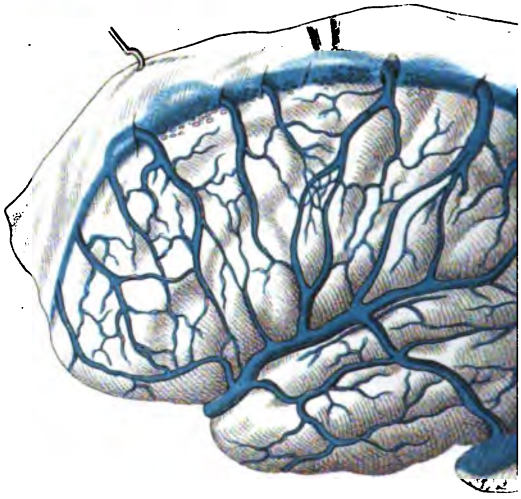


Fig. 4.

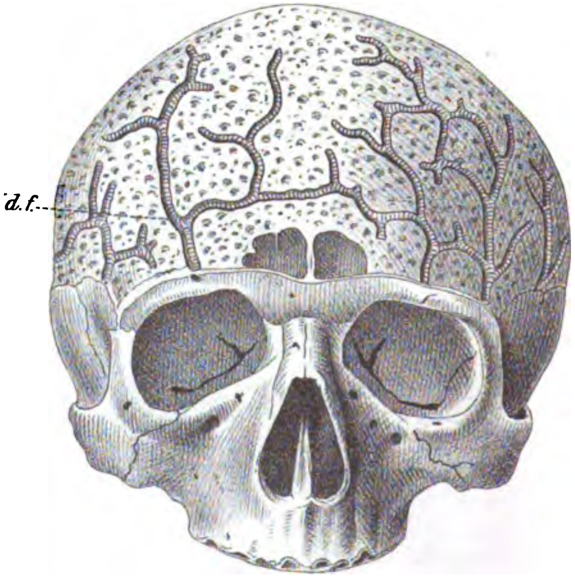
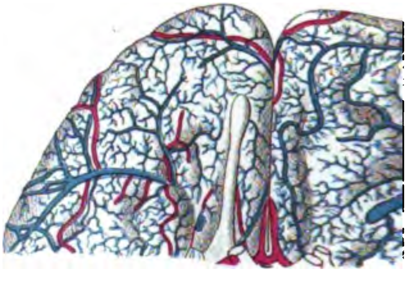
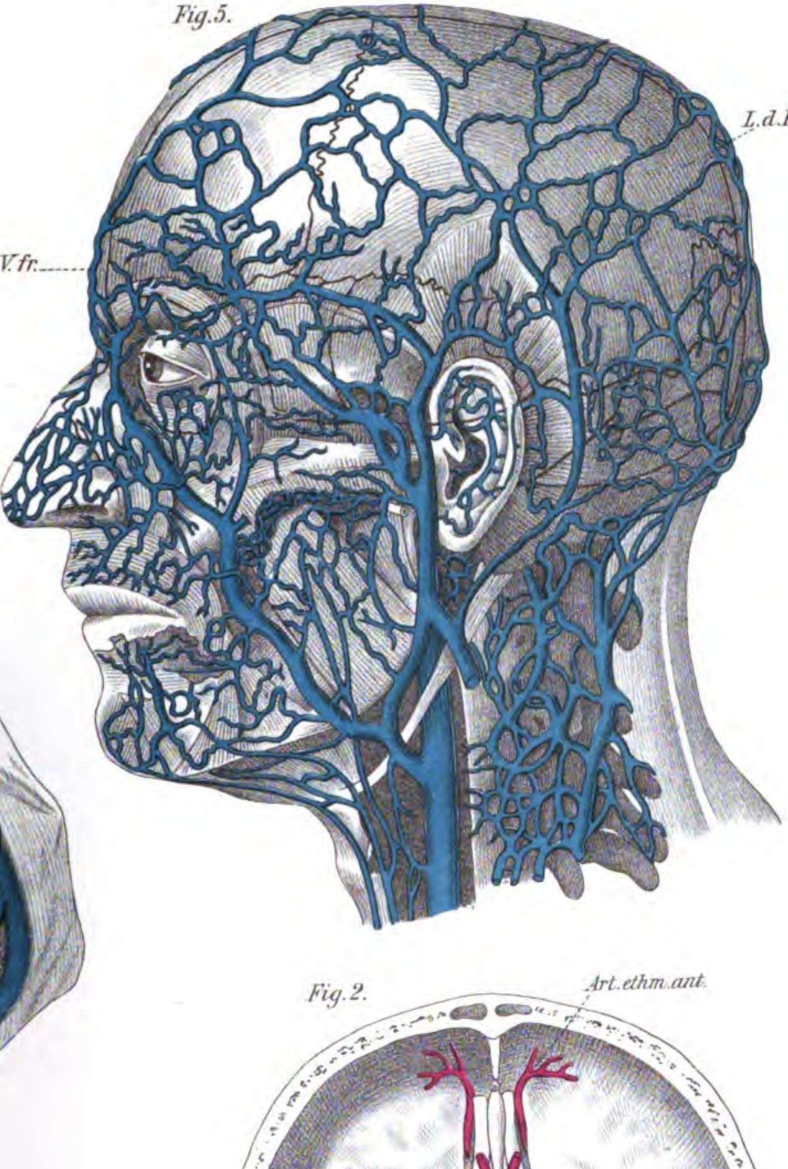


Fig. 3.



Lith. Anst. v. [illegible] Leipzig

Fig. 5.



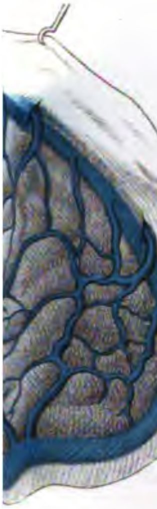
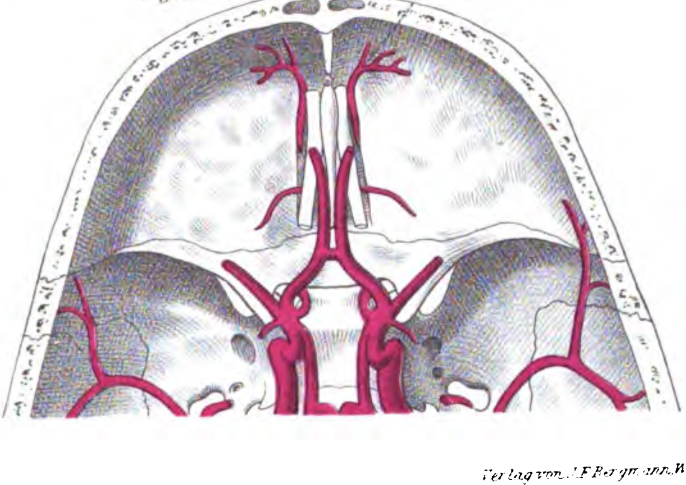
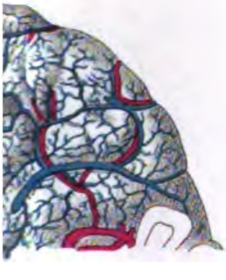


Fig. 2.





Verlag von J. F. Bergmann, Wiesbaden.

A TRUE CHOLESTEATOMA IN THE POSTERIOR CRANIAL FOSSA—INFECTED BY MIDDLE-EAR SUPPURATION—OPERATION—RECOVERY.

By Dr. O. KÖRNER, of Rostock.

Translated and Abridged by Dr. Edwin M. Cox, of New York.

St. A., aged forty-one, came to the clinic June 13, 1900. The patient had suffered for years from severe headaches, which, beginning in the back of the neck, extended over the whole left side of the head. In the middle of March, 1900, he had influenza, followed by profuse discharge from the left ear. He was well and able to resume work in May, the discharge having ceased. Early in June the headaches began again, and the patient noticed a sensitive swelling on the left side of the occipital region, and these symptoms persisted until June 13th, when he came to the hospital.

When admitted he complained of the above mentioned pains and poor hearing on the left side. Midway between the left ear and the occipital protuberance there is a somewhat soft, flattened swelling about one and one-half inches in diameter. There is no change in the skin under the swelling. Through the centre of the swelling a triangular defect in the bone can be felt. This opening has sharp edges; no pulsation can be felt through it. There is apparently no change in the mastoid region.

The left auditory canal is unchanged; the membrana tympani is dull and thickened, somewhat bulging and reddened posteriorly. Puncture brought only blood and serum. Nothing noteworthy on the right side. No disturbances of equilibrium. The only abnormal condition in the eyes is optic neuritis and beginning venous stasis in both, most marked in the left. Temperature

37° C. Pulse 96 to 104. Speech and facial movements undisturbed.

Operation next day. As soon as the swelling was incised there was a flow of odorless pus to the extent of half an ounce. Protruding from the triangular opening in the bone was a shining, pearly mass which came away in layers when scraped with the spoon. Granulations covered the edges of the opening.

The whole mass, amounting in size to two hen's eggs, was removed by the scraping process. The bones of the skull covering the mass were only as thick as paper over a large area of the parietal, temporal, and occipital bones, and the diploë had entirely disappeared. The lower part of the occipital lobe and the cerebellar hemispheres were much displaced and compressed, and the dura to a considerable extent was covered with coarse granulations. Pulsation can be felt but not seen, and the cavity extends as far as the torcular Herophili. In many places the bone is eroded and some of the mastoid cells have been opened by this process ; there is no sign of pus in them. The cavity was lightly packed with iodoform gauze and a strip brought out through the auditory canal. The patient did well continuously and on September 3d his wound was healed. The fundus oculi appeared to be restored to a normal condition. Patient gained 20 pounds during convalescence.

This extraordinarily large cholesteatoma lay in the posterior cranial fossa, and extended from the petrous portion of the temporal bone to the torcular Herophili. The bones in contact with the growth were everywhere thinned, and in one place perforated, and the mastoid cells were also opened. That the tumor had been growing a long time is made evident by the fact that it was so large, and also because it required four weeks for the brain and cerebellum to expand in the cavity to their normal proportions. The growth of the tumor must also have been slow, for it gave no symptoms until the headaches began. Soon after the apparent recovery from the attack of influenza and otitis media the symptoms began again and became more severe, and the sensitive swelling appeared in the occipital region. The optic neuritis also was observed for the first time.

The diagnosis lay between a tumor and an extradural abscess of otitic origin, some examples of which reach a great size and may perforate the cranial bones. The point of perforation, however, was too far posterior for this.

The infection undoubtedly reached the cranial cavity through the eroded mastoid cells from the tympanic cavity, during the intercurrent otitis media. The presence of the granulations was due to the suppurative process.

On October 3d this patient was seen. He feels well, the cicatrix does not pulsate, the drum membranes appear practically normal, and hearing also is nearly normal.

The microscopic appearance of the tumor was that of cholesteatoma.

A CASE OF PYÆMIA CAUSED BY BILATERAL OTITIS MEDIA WITH OSTEOPHLEBITIS OF THE TEMPORAL BONE.

BY DR. E. RIMINI, OF TRIEST.

Translated and Abridged by Dr. EDWIN M. COX, of New York.

SO much attention to pyæmia has, in recent years, been given by the otologist, that it seems worth while for me to report the case which I describe below.

E. S., aged seventeen, student was attacked in May, 1890, with pain in the right ear, and fever. The membrana tympani was seen to be much reddened, and bulging in its posterior segment. Paracentesis was done and relief followed the evacuation of much pus. Next day, signs of trouble appeared in the left ear and the same treatment became necessary, also with a satisfactory result. The patient did well for ten days, when he was seized with sudden headache and his temperature rose to 39 ° C. With the idea that pus had reaccumulated, paracentesis was repeated on each side but without benefit. The eyelids soon became œdematous, the first right metatarso-phalangeal joint swelled, the temperature rose to 40.2 ° C, and the headache became worse.

An operation was clearly indicated and the question as to which side should be attacked was decided by the otoscopic examination. This indicated the right side, upon which accordingly an operation was at once done. The right mastoid was found full of pus and the whole region was in consequence scraped out. The patient improved rapidly, and in eight weeks was discharged cured. The swollen toe joint developed an abscess and required opening.

This case is undoubtedly one of pyæmia, though there was no chill. The abscess in the foot was certainly metastatic. The fact that the temperature remained high spoke in favor of a pyæmic process, and not for a simple abscess of the mastoid.

It is a question, however, whether the purulent material reached the blood current from the primary focus in the mastoid, or from a consecutive thrombo-phlebitis of the lateral sinus. Leutert[1] believes that pyæmia without sinus-thrombosis is so rare that it need not be taken into consideration, but it is not my purpose to discuss at length the question whether this interesting case falls in with these views, or with those of Körner on the subject of pyæmia from osteophlebitis. The latter says that in the form of pyæmia described by him, the most important points are the more frequent occurrence of the condition in acute ear disease with bone involvement, and also the frequency of metastases in joints and muscles instead of in the lungs, as is usual in cases of sinus-thrombosis. The case which we have described was one of acute infection and the metastasis was in a joint. The fact that the temperature fell at once after operation would indicate that the case was one of osteophlebitis.

It is to be remembered that an inflammatory thrombus in the sinus can be dissipated when the focus of first infection is cured, but the temperature fell too rapidly in this case for this condition to have existed. The disappearance of the pyæmic symptoms without operation on the lateral sinus affords additional evidence that the condition was one of pyæmic infection from osteophlebitis without infection of the sinus.

---

[1] "Ueber die Otitische Pyämie," *Arch. für Ohrenhkd.* Band 41.

TWO CASES OF BRAIN ABSCESS—OPERATION —RECOVERY.

By Dr. P. MANASSE, Strassburg.

Abridged Translation by Dr. Arnold Knapp.

Case 1.—R. D., aged thirty-three. No previous ear trouble. Suddenly suffered severe pain in the right ear five weeks ago; otorrhœa set in after two days and was profuse until one week ago. Then severe pain, cessation of discharge, swelling behind and above the ear, vertigo, tinnitus, deafness, and moderate fever.

On admission January 30, 1900—Ear canal stenosed, filled with pulsating pus, posterior and upper walls sunken, *Mt* not visible. There was an œdematous, bluish, painful swelling at upper part of auricle; mastoid tender.

Whisper r=0; voice r=1 *m*. Weber to right. No loss of equilibrium. T. 37.9°. Urine normal.

Operation, Jan. 31st.—Incision back and over the auricle, through the abscess down to the bone. The periosteum was retracted and a fistula as large as a bean and with sharp uneven edges was found above and back of the auditory canal one half *cm* distant from the margin from which pus was escaping. This fistulous opening was enlarged, the bone being very brittle and invaded with pus and granulations. The fistula led to dura, which was discolored and bathed with pus. An opening 1 by 1½ *cm* was found communicating with a small cavity in the temporal lobe. The cavity contained pus and brain debris to a depth of 1–2 *cm*. The entire brain abscess was not as large as a walnut. The tegmen antri and a part of the squama were removed, exposing healthy dura in every direction. Finally the antrum was opened and found filled with pus and granulations. The wound was packed with iodoform gauze.

Healing followed without interruption.

Feb. 16th.—No packing introduced in brain wound.

April 8th.—Discharged without symptoms.

Dec. 22d.—Patient is seen again. The wound is firmly healed. No symptoms. *Mt* closed. Whisper heard in 4 *m*.

This was a case of acute otitis media, followed by ostitis of the temporal bone and formation of a brain abscess in a relative short space of time. The latter had given no symptoms and was only detected at operation by a fistula leading through the bone and dura into the substance of the temporal lobe. The otitis, ostitis, and brain abscess are now completely healed.

CASE 2.—K. St., twenty-four years old, with right otorrhœa since childhood; has suffered with severe headache for four days, and a weakness in the left arm and leg.

Admitted Nov. 10th. Fully conscious; complains of severe headache. The head is freely movable. T. 38.4°. Pulse 48. Herpetic vesicles on upper lip. Slight paresis of arm, leg, and face. Left *Mt* normal. Right: polypus in auditory canal surrounded by white cholesteatomatous masses with fetid pus. Mastoid process not abnormal. Fundus oculi: on both sides dilated veins, undefined margins of the papillæ.

Diagnosis: Cholesteatoma of right middle ear. Abscess in right temporal lobe.

Operation.—Bone very white and hard. The antrum contains cholesteatomatous masses and pus. The posterior wall of the canal is removed. There are no ossicles. After removal of tegmen antri and tympani the dura is found covered with granulations at a small area over the antrum, and is further exposed in the region of the squama.

Aspiratory puncture of the temporal lobe is made at the side of the granulations; the syringe became filled with greenish-brown stinking pus. The dura and brain are incised and a cavity containing about 100 *ccm* evacuated. The walls of this abscess, as large as a hen's egg, are green, uneven, with many depressions and pockets. The cavity is gently curetted and packed with iodoform gauze.

Nov. 12th.—Dressing changed; some pus in cavity; temp. 38.4°; pulse 48.

Nov. 17th.—More pus evacuated.

Nov. 24th.—Vomiting, headache; paresis of left arm more distinct; pulse 50.

Nov. 28th.—Pulse 48; the finger is introduced in wound; pus and necrotic brain substance released.

Dec. 5th.—Condition improved; pulse 62, soft.

Dec. 7th.—Pulse 72; fundus oculi: swelling of discs less, numerous hemorrhages.

Gradual improvement followed; pulse normal; wound smaller, healing rapidly. The patient is up all day, no symptoms; the pareses have disappeared and the fundus image is returning to the normal.

This patient, in the course of an old chronic middle-ear suppuration, suddenly showed the typical signs of a brain abscess with paralysis of the opposite side. The radical operation was immediately performed and the abscess evacuated. The abscess was quite large, filled with fetid, greenish pus, without a lining membrane.

On comparing these two cases we find the first difference in the etiology. The abscess in the first case followed an acute, in the second a chronic otitis. The history of the first case extended only over five weeks, while in the second the otorrhœa was of twenty years' standing and the abscess had probably existed for quite some time.

The cases presented the following anatomical differences. In the first the abscess contained yellowish-red, thick, and odorless material. The walls were formed by hemorrhagic infiltrated brain substance. In the second abscess the contents were thin, greenish-black, fetid, and the wall was an uneven, greenish mass quite unlike brain tissue. The two abscesses were of unequal size: the first and acute one was small, with very little pus; the second and chronic one contained about 100 *ccm.*

Regarding the symptoms, there were none suggestive of a brain abscess or an intracranial lesion present in the first case. In the second there were:

1. Typical general symptoms: headache, choked disc, slow pulse, later vomiting.

2. Local symptoms, such as paresis of the left arm, leg, and face. These local symptoms are rare in abscesses of the temporal lobe.

Treatment in both cases was the same: eradication of the primary focus; then opening and draining the abscess in the usual manner.

The prognosis was unfavorable in these cases, as the abscesses were not encapsulated. According to our experience, the encapsulated abscesses are more favorable; the diffuse abscesses without a firm membrane are unfavorable because it is difficult, on account of the prolapse of the brain tissue, to control all the pockets, and retention of pus with its complications is apt to follow.

THE TECHNIQUE OF INTRANASAL OPERATIONS.

BY DR. ALFRED DENKER, OF HAGEN.

Translated and Abridged by Dr. EDWIN M. COX, of New York.

IN all surgical work, the aim is to prevent loss of blood, on the one hand because the patient's interests are thus served, and on the other, because the field of operation is thus kept free from blood. In most parts of the body hæmostasis is usually easy to accomplish by one means or another, but in the cavities which are necessarily worked upon at a depth and by artificial light, the control of hemorrhage when the mucous membrane is cut is a matter of difficulty. This is notably the case in operations upon the nasal septum, the vessels of which cannot, of course, be ligatured. The galvano-cautery furnishes one means by which operations upon the septum and turbinates can, as a rule, be rendered practically bloodless, and Ostmann, in Band ix. of *Archiv für Laryngologie und Rhinologie*, has given a special method by which this result can be attained. This method resembles very closely the plan which I have advocated during the past few years of using the galvano-cautery as a preparatory act in operations on the bony and cartilaginous portions of the interior of the nose. Two objects are attained by this use of the cautery. The patient is not disturbed by the flow of blood into the pharynx and from the nostrils, and the field of work is not obscured, so that no time is lost; and, furthermore, secondary hemorrhage is not so likely to occur, tamponade being thus avoided. Kreilsheimer[1] speaks well of the use of the galvano-cautery after operations to prevent secondary bleeding, but does not emphasize the usefulness of the same instrument before operations in order to avoid hemorrhage at the time of operation, according to the method suggested by Ostmann and myself. For the removal of the ordinary hypertrophic masses of the middle and inferior turbinates, I have found the hot snare very satisfactory, but I think that for the removal at one sitting of several of the very large hypertrophies, it is a good plan to divide the afferent vessels according to the method suggested.

In making resections of the cartilaginous and bony prominences of the septum, I proceed according to the following plan, using 10% cocaine solution as an anæsthetic: If the obstruction is an antero-posterior prominence, it may be furrowed deeply with the suitable cautery point in the lines along which the chisel or saw is to be operated, and after this one of the latter instruments may be used without causing any particular hemorrhage. The galvano-caustic action must be permitted to go entirely down to the bone or cartilage, as the case may be. The removal of a spine is accomplished in the same way. In removing a portion of the inferior turbinate, I follow the method of Ostmann, which consists in the same use of the cautery, with subsequent removal of the mass with the scissors.

My experiences have shown that the use of the galvano-cautery in this way in nasal operations prevents hemorrhage and obviates the necessity of tamponade.

---

[1] *Arch. f. Laryng. u. Rhin.*, Heft 2, Band ix.

THE HISTOLOGY OF AURAL POLYPI.

By Dr. G. BRÜHL, Berlin.

Translated by Dr. Arnold Knapp, New York.

I.

THE first histological examinations of aural polypi were made by Pappenheim in 1840. Numerous papers on this subject have since appeared. The authors divide aural polypi into mucous and mucous-gland polypi, round-celled polypi, fibromas, myxomas, fibro-myxomas, angiomas, angio-fibromas, and granulation polypi. It is now generally accepted that all aural polypi are at first granulation tumors which secondarily develop into the other tumor forms. The term "mucous-gland polypus" should be dropped, because mucous glands rarely, if ever, occur in aural polypi. Schwartze recognizes aural polypi with epithelial covering, and polypoid granulations without epithelium, a distinction which Kuhn does not recognize, but which has recently been taken up again by Jacobson.

The number of new methods of histological investigation have induced me to take up the subject of the histology of aural polypi again.

II.

Sixty aural polypi, after fixation in alcohol or sublimate, were stained by the following methods, which may also be recommended for histological examination of the ear in general.

1. Double stain with hæmatoxylin-eosin.
2. Benda's iron hæmatoxylin.

(a) Section in 30 % ferrous-sulphate solution for ten seconds.
(b) Distilled and spring water.
(c) 0.5 % hæmatoxylin solution.
(d) 1 % acidulated alcohol.
(e) Distilled water, absolute alcohol, xylol, and balsam.

3. Hyalin stain, after Unna.
    (a) Overstain in hæmatoxylin.
    (b) Water.
    (c) 1 % saffranin solution, ten minutes.
    (d) Water.
    (e) 33 % watery solution of picric acid, thirty seconds.
    (f) Water.
    (g) Alcohol, oil of bergamot, and balsam.
4. Plasma-Mastzellen stain, after Unna.
    (a) Polychrome methylene blue, fifteen minutes.
    (b) Decolorize in water with the addition of one drop of glycerin-ether mixture.
    (c) Water.
    (d) Alcohol, oil of bergamot, and balsam.
5. Elastin stain, after Unna.
    (a) Ten minutes in warm orceïn solution (orceïn 1, hydrochloric acid 1, absolute alcohol, ad. 100).
    (b) Acidulated alcohol, six seconds.
    (c) Water.
    (d) Alcohol, oil of bergamot, and balsam.
6. Elastin stain, after Weigert.
    (a) Weigert's fuchsin, twenty minutes (fuchsin, 2, resorcin, 4, distilled water, 200).
    (b) Alcohol.
    (c) Xylol, balsam.

The hæmatoxylin-eosin stain was used in all cases, and served to control the results obtained by the other stains. For Unna's stains, hardening in absolute alcohol alone was used.

III.

Many aural polypi were found to contain an unusually large number of cells. This necessitated a more exact study of the cells, especially Unna's plasma cells. Most aural polypi are round-celled. These round-celled polypi afford unusual opportunities for the study of comparative cellular structure.

Unna regards the term round-celled as erroneous, in which opinion I concur. If a section of a round-celled polypus, stained with hæmatoxylin-eosin be examined with an immersion lens, the difference between the cells is very apparent. This distinction is even more striking with Benda's stain, and with the selective staining methods of Unna. Most all polypi, which we prefer to call polypoid granulations, owing to their anatomical similarity to granulations, contained, in addition to the epithelium, the following varieties of cells, which Justi has also found in numerous granulations:

1. Polynuclear leucocytes.
2. Mononuclear leucocytes.
   (a) Small (lymphocytes).
   (b) Large.
3. Formative cells of connective tissue (fibroblasts).
4. Formative cells of the blood-vessels.
5. Giant cells.
6. Unna's plasma cells.
7. Mastzellen.

These cells are present in polypoid granulations in the ear in varying quantities and are collected together in a granular intercellular substance. The intercellular substance shows a fibrillary structure when the granulation begins to shrink. The polypoid granulations have numerous thin-walled blood-vessels which become thick-walled in the process of shrinkage.

The polynuclear leucocytes are situated in the blood-vessels, in their neighborhood, and frequently in groups, especially near the surface of the polypus. They were also found between the epithelium cells on the surface, occasionally grouped so closely as to almost hide the epithelium.

Stained with hæmatoxylin-eosin, the protoplasm is pale and the darkly stained nucleus presented many chromatin granules. Nuclear remnants were often found in the midst of these collections; their origin from polynuclear leucocytes was clearly to be seen. Stained with Unna's polychrome methylene blue, the polynuclear leucocytes have a dark blue nucleus, but the protoplasm is always unstained. In addition to the polynuclear leucocytes, *mononuclear cells* with round nuclei were also present. Some of these were small (lymphocytes) and were collected together like follicles; others were larger (8–10 μ) and their protoplasm stained light red with eosin. Their nucleus was frequently situated eccentrically and presented a nuclear network with large, peripheric chromatin granules. If we compare these cells with the leucocytes found within the blood-vessels, it is readily seen that the latter are mononuclear leucocytes. These large mononuclear leucocytes are collected in groups about the vessels, which they accompany throughout the tissue.

When stained with polychrome methylene blue, the large mono- or polynuclear leucocytes partly show a definite stain of the protoplasm. The protoplasm ring of the lymphocytes may be stained evenly pale blue, but never in the characteristic way of the large leucocytes. In a large part of these the protoplasm of the cell body is dark blue and granular, the cell centre is paler, and the round nucleus a deep blue. Chromatin granules are found at one extremity of the cell.

If we compare two successive sections from the same polypus, we find the cells which, stained with the hæmatoxylin-eosin we have taken for mononuclear leucocytes, show, on being stained with polychrome methylene blue, the characteristic protoplasm stain. They are, in other words, Unna's *plasma cells.*

The polypoid granulations also contain oval or elongated spindle-formed cells. These have a large (6 μ) pale nucleus and a finely granular chromatin network. The protoplasm is frequently striated and is stained a light red with eosin; it frequently shows elongations. These connective-tissue cells, *fibroblasts,* are not found in large numbers in between the leucocytes, but are more frequent when the polypoid granulation tends to shrinkage; at the same time the fibrillar intercellular substance is present. Stained with polychrome methylene blue, the fibroblasts usually present an unstained protoplasm, though occasionally it may be blue with fine granules, but never in the characteristic manner of the plasma cells. The nucleus has a blue chromatin network and rarely large blue granules. Oval cells with blue nuclei, resembling fibroblasts, are found in the walls and in the neighborhood of the blood-vessels. The vessels often show signs of vascularization, rarely buds and elongations. The walls of the vessels in polypoid granulations undergoing shrinkage are concentrically thickened by grouping of the cells which contract, almost obliterating the lumen. Polychrome methylene blue does not stain the protoplasm of those cells formed from the vessels.

The giant cells which we find in polypoid granulations present between ten and forty nuclei in a homogeneous protoplasm. There is usually no evidence of tuberculosis. According to Ziegler, giant cells are explained by cell division of fibroblasts without participation of the protoplasm. Finally, in sections stained with polychrome methylene blue, we encountered cells which were very noticeable on account of their color reactions. These were large oval or fusiform cells with granular red protoplasm and a centrally situated blue nucleus rich in chromatin. These cells were *Mastzellen* and were usually situated near the surface of the polypoid granulations and covered with epithelium.

The study of our sections of polypoid granulations enables us to express the following view as to the nature of Unna's plasma cells: This term, as is well known, was introduced by Waldeyer for certain connective-tissue cells. Unna believed he had found a definite color reaction (blue staining of the granular protoplasm) for these cells with his polychrome methylene blue stain. According to Unna, plasma cells are hypertrophied connective-tissue cells through the agency of some infectious irritation. They alone show this characteristic color reaction, according to him. Jadassohn believes that the plasma cells are derived from migrated leucocytes, but does not consider that it has been proved that Unna's reaction is sufficient to distinguish the derivatives of these cells from leucocytes rich in protoplasm. A number of other investigators have expressed themselves against the purely connective-tissue origin of plasma cells. Unna has recently recognized the indisputable identity of the small (daughter) plasma cells with the so-called lymphocytes.

Our findings in the polypoid granulations of the ear showed that the plasma cells are identical with large mononuclear leucocytes. The greater part of the polypoid granulations in the ear is formed by plasma cells.

Unna says that a severe irritation acting upon fully developed tissues is necessary for their origin, which holds true in the polypoid granulations produced by aural suppurations. Justi believes that plasma cells serve to transport certain products from the tissues to the lymph channels. The numerous quantity of plasma cells to be found in polypoid granulations is an evidence that great cell formation and still greater cell destruction are favorable conditions for their development.

Elastic fibres were sought for in the polypoid granulations with the aid of the Unna-Taenzer and Weigert's stain. They were, however, only found in the walls of the blood-vessels. This can be explained by Kromayr's statement that the formation of elastic fibres is greater and more rapid the slower the tissue grows and the farther removed it is, theoretically, from inflammatory granulation tissue.

We frequently came across the so-called Russell's fuchsin bodies, small or large hyalin discs staining light red with eosin and tomato-red with Unna's hyalin stain. In many specimens stained with hæmatoxylin-eosin there were large mononuclear leucocytes, whose red protoplasm appeared homogeneous, and the crescentic blue nucleus near the periphery could only be made out with difficulty. Unna's stain gave this protoplasm a tomato-red color. Most of Russell's bodies resembled these cells both in size and in location. One Russell's body was found in the midst of a hemorrhage. Some authors are inclined to regard these bodies as derivatives of round cells. We are inclined to agree with Schmaus and Böhm that the Russell's bodies are derivatives of large mononuclear leucocytes—that is, the hyalin product of their protoplasm.

In regard to the presence of glands, it is well known that, if epithelium similar to the surface epithelium dips into the underlying tissue, it appears like a gland on cross-section. We have, however, observed polypi with squamous epithelium on the surface and with shut-off spaces lined with cylindrical epithelium, which simulated glandular ducts. In any case, glands are very rarely found in aural polypi.

The epithelium covering a polypus is not always like the epithelium of the mother tissue. The mucous membrane of the mastoid cells has a very thin layer of squamous epithelium. The middle-ear polypus which arises from it, and which is often incorrectly called "polypus of the aural canal" (von Tröltsch), ought to present the same epithelium as the mother tissue; they were, however, in all cases, covered either with epidermis of the neighboring integument of the aural canal, for their origin was always in the cells of the posterior wall of the auditory canal. Polypi from the promontory are not covered with cubical epithelium, as is the promontorial membrane. Stratified squamous epithelium, as certain middle-ear polypi possess, has never been found in the normal tympanic membrane. The epithelial covering, whether squamous or cylindrical, can never be regarded as a distinguishing feature between a polypus of the canal and one of the middle ear. The same polypus may show both kinds of epithelium in rapid variation, which presumably depends upon entirely different causes than the epithelium of the mother tissue. It is well known that the epithelium covering aural polypi may be destroyed by suppuration and may never be permitted to develop. Hence the epithelial covering never gives us a safe guide to the origin of the polypus. The mother tissue characterizes the polypus, but not its envelope.

In our specimens there were 47 polypoid granulations, 8 fibromas, 5 myxo-fibromas. Of the 47 polypoid granulations, 26 were without epithelium, 21 with an epithelial covering.

Of the 8 fibromas all showed epithelium. Of the 5, myxo-fibromas, all had an epithelial covering.

The kind of epithelium was in the

	21 polypoid granulations :	8 fibromas :	5 mixo-fibromas:
Cylindrical,	9 times	2 times	1 time
Squamous,	7 "	5 "	4 times
Mixed C. and S.	5 "	1 time	0

The question whether aural polypi are tumors and what position we should give them in pathological histology can be answered by first stating the following sentence of Ziegler's: "The tissue formation which leads to the development of a growth, of a neoplasm, or of a tumor in the stricter sense, is a process which cannot be compared with hyperplastic granulations or to inflammatory tissue formation."

Most of the polypi arise in the course of a protracted aural suppuration. These suppurations cause extensive destruction of the skin, mucous membrane, periosteum, and bone of the ear, and this destruction of tissue is followed by an attempt at repair by the formation of granulations; obliteration of the vessels, development of connective tissue, sclerosis, and cicatrization do not occur in the granulations as in the normal process of healing; on the contrary, the continued injury to the tissues forms a constant incentive to the development of blood-vessels, migration of cells, and proliferation—in other words, to increased growth of the granulation. If this is true for the hyperplasias occurring in the ear in the form of polypi, these must be inflammatory tissue formations and not new growths.

The anatomical picture of granulation tissue was present in 78.3% of our polypi; histologically, therefore, a part of the aural polypi may be regarded as polypoid granulations.

In polypoid granulations, we have to distinguish between those with none and those with little fibrillary intercellular substance. The former are the more common. In about 25% we found sparse fibrillary tissue associated with many fibroblasts and hypertrophied vascular walls. At the same time, polypoid granulations at this stage of connective-tissue development cannot be regarded as fibromas or angio-fibromas, because they still show cells of inflammatory irritation in preponderance—namely, polynuclear and mononuclear leucocytes and plasma cells. There were more cells than basement substance and the epithelial covering was often wanting. In the fibromas and myxo-fibromas of the ear there is always more basement substance than cells. Wherever larger collections of cells were present, these were not of inflammatory origin, but resembled lymphocytes collected together in follicles, or as in adenoid tissue. The surfaces of the fibromas and myxo-fibromas were in all cases always covered with epithelium. *Polypoid granulations of the ear are consequently not tumors, but inflammatory tissue formations.*

In the case of the fibromas and myxo-fibromas of the ear, the question arises whether these are really tumors or the result of local inflammatory tissue changes and hyperplasias. As in the urethra, under constant irritation of pus, fibrous hyperplasias are formed,—condylomata,—so in chronic suppurations of the ear hyperplasias appear in the form of polypi. These are to be regarded as fibrous and myxo-fibrous hyperplasias and are no more tumors than are the polypoid granulations. At the same time, fibromas and myxo-fibromas are distinct histologically from the polypoid granulations, even if the latter begin to form connective tissue.

Fibromas and so-called myxo-fibromas, originating by œdematous infiltration of the connective-tissue fibres, demand histologically an independent position. We consider them tumors, but cannot regard them as terminal stages of polypoid granulations.

The simultaneous occurrence of fibromas and granulation polypi in the ear does not prove that the fibroma is derived from the granulation polypus. Granulation polypi may become *fibromatous, but not fibromas.*

The age of polypoid granulations does not necessarily influence their histological structure. Most of the polypi are comparatively old, having existed for a number of years. The duration of their existence was in most cases fully sufficient to have permitted the transformation of the polypoid granulation into a fibroma or myxo-fibroma before their removal; and we should, consequently, in the majority of extirpated aural polypi, find fibromas or myxo-fibromas.

Histological examination of aural polypi, however, has shown the preponderance of polypoid granulations. Moos and Steinbrügge found amongst a hundred polypi, fifty-five granulation tumors, twenty-seven angio-fibromas, fourteen fibromas, and four myxomas. If we regard the twenty-seven angio-fibromas as fibromatous polypoid granulations, then we have eighty-two polypoid granulations (82 %). Weydner found amongst seventy-three polypi, fifty-six polypoid granulations and seven fibromas.

We found in sixty polypi, forty-seven polypoid granulations, eight fibromas, and five myxo-fibromas. These three statistics show that 78 % of all aural polypi are polypoid granulations. Hence, it seems to us essential to regard all aural polypi as various stages of the same process. There are young aural polypi which have the characters of fibromas, and old polypi which are polypoid granulations. Polypoid granulations remain as such, fibromas have from the very beginning a tendency to become fibromas.

The majority of aural polypi, 78 %, are not tumors, but are inflammatory tissue formations. The minority, 21.7 %, are tumors. These, in our cases, were always covered with epithelium, while the polypoid granulations were only so covered in about one half the cases.

According to the histological structure all polypi may be divided into polypoid granulations (partly fibromatous) and fibromas (partly myxo-fibromas).

OPERATIONS ON THE MASTOID IN CONSTITUTIONAL DISEASE.

By Dr. ERNST BARTH, Brieg, near Breslau, Germany.

Translation by Dr. Adolph O. Pfingst, Louisville, Ky.

A.—A case of mastoiditis in a diabetic subject.

THE operative treatment of suppurative mastoiditis occurring in diabetic subjects has been so little discussed in medical literature that I feel justified in reporting a recent case from my practice. The case is of especial interest when considered from the standpoint of the advisability of undertaking major operations upon diabetics. This has ever been a disputed question, and each case added to literature may eventually lead to a uniformity of opinion as to the significance of sugar in surgical cases.

A male, sixty-four years old, apparently in good general condition, gave a history of a double iritis a year previously. He gave no other history or showed no other evidence of a syphilitic infection. At the time of the eye trouble it was discovered that diabetes existed. There was then 4 % sugar, which was rapidly reduced to 2 % by dietetic treatment. A year later and while the patient was still keeping up an antidiabetic diet, he contracted an acute middle-ear inflammation on the right side, following a bath on a cold day. His temperature became elevated, his head ached, and the ear discharged a reddish and later a purulent fluid. At the same time he had a slight nasal hemorrhage.

On June 18, 1899, when I first saw the patient, there was a profuse discharge of thick yellow pus from the right ear. The drum was thickened and red, and was marked in the postero-inferior quadrant by a light reflex indicating the point of exudation of the pus. There was slight tenderness on pressure over the tip of the mastoid, otherwise the external parts were normal. The patient could hear a whisper with right ear when spoken directly into the ear. Bone-conduction from vertex best towards right side. The temperature was 100.4°–100.9° F. The urine at this time contained 2.5 % sugar. Following the use of cold locally, rest in bed, and strict antidiabetic diet, with frequent irrigation of the ear, the temperature soon returned to normal. Otorrhœa remained profuse, while the tenderness over the mastoid slowly increased, and some swelling became evident. Tenderness and swelling very slowly increased, but owing to the age of the patient and the presence of 2.5 % sugar, surgical interference was delayed as long as possible. In August, although the urine contained only 1% sugar, none of the other symptoms had subsided. On the contrary, the swelling had now extended to the posterior wall of the ear canal. The membranous wall soon gave away, a quantity of pus discharging through the opening. A probe introduced through this opening came upon necrosed bone. Throughout September there was but little change in the condition. Sugar, 1%. In October a decided change for the worse was apparent. While otorrhœa continued, the temperature rose to 101.4°–100.3° F., the pulse being correspondingly accelerated. Sugar had increased to 2½% notwithstanding a strict antidiabetic diet. Sensitiveness over the mastoid was now pronounced and persistent headache was complained of. A loose piece of bone could be felt through the fistula in the posterior ear-canal. Swelling had extended down the mastoid a little below the tip, making movements towards that side of the head difficult and painful. An operation was now imperative, and was performed Oct. 9th, under chloroform narcosis. The mastoid was found discolored, bluish, and was soft as far as the tip; upon elevating the periosteum pus exuded freely from between the posterior bony ear-canal and the soft parts. After a few strokes of the chisel, almost the entire posterior osseous ear-canal came away, and a sequester as large as a bean. It took but little chiselling to enter the antrum, thereby completing a radical operation. The ossicles were carious ; also the tip of the mastoid, which was removed. Koerner's plastic.

The patient stood the operation well and improved rapidly. The temperature soon returned to normal, and by observing strict rules of diet sugar entirely disappeared from the urine in two weeks. The wound, which was unusually sensitive, healed very slowly, though without complication. It required seven months for complete closure to take place. Two weeks after the operation another small sequester was detached from posterior part of the wound.

A feature in this case worthy of mention was a scaly formation upon the skin in the vicinity of the wound, especially in the concha. This not only lasted during the process of healing, but persisted afterwards and yielded only to treatment with borated vaseline.

The function of the right ear was reduced so that a whisper could not be heard. He could, however, hear ordinary conversation with that ear. From vertex, sounds were best conducted towards the right ear. For tuning-fork the conduction by air was lost on right side ; for bone it seemed about normal. A clinical feature of interest in this case was a disturbance of the power of maintaining the equilibrium. It began about the third or fourth month and was described by the patient as an unsteady feeling, especially upon arising or during physical exertion. It could best be controlled by steadying the head with the hand. This symptom was very marked whenever the patient suddenly turned around. It was never present when writing or reading. This condition has remained to the time of this report—nine months after the operation. The patient has had no other treatment than dietetic.

This case teaches us that it is not always advisable to defer operative measures upon diabetic subjects too long. Had this case been operated upon four weeks after the mastoid inflammation set in, at a time when the urine contained but 1 % of sugar, I believe that a much better chance would have been given the patient for retention of his hearing. During the time that I waited, necrosis was going on in the bone and the tympanic cavity.

We further learn from this case that even at sixty-four years, with 2½ % sugar in the urine, and with necrosis going on in the bone, good results can be expected from major operations.

I have been unable to account for the disturbance of the equilibrium. It appeared while the wound was healing and after the urine ceased to contain sugar.

B.—A case of suppurative mastoiditis. Operation. Process of repair interfered with by gout.

It is not uncommon to find evidences of gout in the external ear. Garrod claims that gouty nodes can be found in the concha in about fifty per cent. of all cases of arthritis. Brieger and Ebstein have expressed similar views, the latter laying some stress upon the diagnostic value of the presence of these gouty nodes.

So far no evidences of gout have been found in the middle or internal ear. The following report represents a case of mastoiditis in which gout retarded the process of repair:

A male, aged sixty-three years, complained of severe headache during an attack of coryza. Six days later, the left ear began to discharge pus. The headache persisted, and the mastoid gradually became sensitive to pressure, while the soft parts became swollen and red. The right drum was normal; the left, dark red and marked in its postero-inferior quadrant by a pulsating light reflex. Sounds from a tuning-fork on the vertex were conducted to the left side. The patient could hear whisper on left side only when spoken directly into the ear.

On April 26th, the drum was incised and leeches applied externally, but without avail. On April 28th, I opened the mastoid under chloroform narcosis. Upon removing the normal cortex, the mastoid cells were found filled with pus. The spongy bone was removed with a curette, thereby creating a large cavity surrounded by healthy bone. On the day following the operation, the patient was doing well; but on the second day the temperature rose to 103.6° F. without being preceded by a chill, pulse 100, and the headache returned. The wound had become very sensitive to pressure. My anxiety over these untoward symptoms was relieved by the discovery that the patient had a typical case of gout, which had been overlooked by him on account of his ear trouble. The metatarso-phalangeal joint of the left big toe was much swollen and the skin over it tense and reddened. There were no gouty nodes in the ear, but the wound behind the ear was extremely sensitive, somewhat swollen, and red. The bone was not affected. The swelling and redness disappeared, as they came, with the swelling of the toe; four grams of sidonal being administered daily. In the weeks following, the patient had other, though milder, attacks of gout, and each time the edges of the mastoid wound became sensitive and red, and again returned to normal with the subsidence of the gout.

It is evident that the infiltration of the mastoid wound in this case was a gouty condition, not only on account of its coincident beginning and termination with the swelling in the toe, but on account of its influence upon the repair of the wound. The process of repair was exceedingly slow, and was hastened by none of the local remedies applied—nitrate of silver, camphor, or iodoform. The otorrhœa was not influenced by the gouty condition, as is evidenced by the disappearance of pus and closure of the drum soon after the operation. The patient could hear whisper at three feet. The tuning-fork was still heard best on left side from the vertex. As there was more functional disturbance following this case than is usual in uncomplicated cases, I take it that gouty deposits had also taken place in the tympanic cavity.

C.—Tuberculosis, middle-ear and mastoid suppuration occurring simultaneously with pulmonary tuberculosis. Operation. Recovery.

Middle-ear and mastoid disease complicated by pulmonary tuberculosis is a subject of much interest on account of the variability of symptoms and on account of the difficulty of determining whether the cause of the symptoms is in the ear or in the lung. The following case is one rather out of the ordinary:

Male, twenty-one years old, in good general condition, dates his trouble back to January, 1900, when he had an acute pharyngitis. Following this, his left ear began to discharge pus. He applied to me for treatment on February 3d, because the otorrhœa had become more and more profuse. The left ear canal at this time was very much narrowed in its depth by swelling of the posterior and antero-inferior walls. The narrow aperture rapidly filled up with pus when cleansed. The mastoid appeared normal. The hearing of the left ear was so reduced that the voice could not be heard when spoken directly into the ear. The tuning-fork on vertex was best heard on the left side.

The patient was put to bed and treated by frequent irrigations and loose packing with iodoform gauze. The profuse discharge continued, and although the patient had afternoon temperature ranging from 101.3° F. to 102.2° F. he complained of no pain or discomfort. At this time he began to have night-sweats, which led me to examine his lungs. I found that the right upper lobe was involved. There was dulness on percussion, short inspiration, and bronchial expiration. There had never been any cough or pains in the chest. While this condition, together with the absence of pain in the ear, led me to suspect a tuberculous ear-affection, it was impossible to demonstrate the presence of tubercle bacilli in the pus.

The profuse flow of pus continued, also the afternoon rise in temperature, no other symptoms, however, to indicate mastoid involvement appearing. On February 12th, fearing involvement of the bone on account of the profuse otorrhœa, and that more serious complications might arise, I decided to open the antrum. Under chloroform narcosis, pus was reached by removing a small piece of the cortex. The pus contained unmistakable tubercle bacilli. The mastoid cells and antrum were cleansed of pus and granulation tissue, and the wound dressed with iodoform gauze The patient stood the operation well, but his condition otherwise remained unchanged. The profuse otorrhœa continued, as did the afternoon rise in temperature.

After about a week pus was discovered coming from the angles of the wound. With a probe it was found to be coming from two fistulous tracts running well under the skin and into the muscular tissue. On Feb. 23d they were split under chloroform narcosis, all of the diseased tissue removed, and the wound tamponed with iodoform gauze.

On March 10th there was still no appreciable decrease in the amount of secretion from the ear canal. The swelling in the ear canal was also as marked as it was before the operation, only a narrow strip of the drum being visible. Spongy granulation tissue had formed at the bottom of the cavity in the bone. This was curetted, and though done without a narcotic, did not cause the slightest pain.

March 15th.—The temperature, which heretofore had seldom run over 101.3°, has for several days exceeded that. The physical signs over the left lung were unchanged, but the patient now complained of pain in the throat, especially upon swallowing. Examination of the throat revealed nothing markedly abnormal.

March 16th.—The left half of the soft palate was now displaced forward and was sensitive to touch at upper end of the anterior faucial pillar. A large amount of pus was evacuated upon incision of the swollen area. Tubercle bacilli could not be found in this pus.

The opening of the peritonsillar abscess marks the turning-point in this case, for in several days the temperature had returned to normal, and the otorrhœa had ceased. The wound in the mastoid took its normal course, and closed perfectly in nine to ten weeks. When the patient was discharged, he weighed twenty-six pounds more than at the time of his admittance to the hospital. The lung had returned to normal, auscultation sounds being the same on both sides. Normal respiratory murmur was again audible on the left side. The perforation in the drum had closed. The Eustachian tube was open. Conduction by air was better than by bone on the left as well as the right side.

From the vertex sounds were still conducted best to the left side. Whispers could be heard at five feet with this ear. This perfect result has remained unchanged up to the time of this report (five months), the patient now being in a perfect physical condition.

There can be little doubt as to the nature of this case. There was not only involvement of the upper lobe of the left lung to indicate tuberculosis, but the tubercle bacillus was found in the pus removed from the mastoid during the operation. The unusually profuse discharge of pus, the absence of earache, and the formation of fistulous passages at the angles of the wound in the mastoid were also indications of tuberculosis. The question arises whether we were dealing with a primary tubercular trouble in the mastoid, in which the tympanic cavity was secondarily involved, or whether the infection was carried from the respiratory passages into the tympanic cavity.

Infection through the Eustachian tube does not seem probable when we consider that the patient had no cough or expectoration or bronchial inflammation. The return of the tympanic cavity and membrane to normal is strong evidence that tuberculosis did not exist in these parts, or there would have been extensive destruction in the tympanum and necrosis of bone. It seems that in our case the tubercular process was in the mastoid bone and that the tympanic cavity and perforated drum acted as a passage for the escape of pus. It is not meant by this that the tympanic cavity was entirely inactive in the formation of pus. The continuance of the otorrhœa after opening and cleansing the mastoid was evidence that the tympanic cavity was concerned in the pus formation. Whether the peritonsillar inflammation influenced it, is a question difficult to solve. Certainly, the immediate cure of the otorrhœa after opening the peritonsillar abscess would make a connection between the two seem almost certain. It is true that the throat was painful only on the three days prior to the incision of the abscess, whereas the otorrhœa had lasted six weeks. Nevertheless the inflammation of the peritonsillar tissue may have been going on for a long time before the abscess developed. The peritonsillar inflammation may have begun at the time of the pharyngitis already referred to; more likely, however, it was caused later by the pus which drained into the pharynx through the Eustachian tube.

EYE-DISEASE IN RELATION TO TUBERCULOSIS OF THE NASAL MUCOUS MEMBRANE, AND THE TREATMENT OF THE LATTER BY MEANS OF LACTIC ACID.[1]

By Dr. V. HINSBERG, Breslau.

Translated by Dr. Carl Mund, New York.

At a meeting of the German Laryngological Society (Heidelberg, 1899), Seifert read a paper on the relation of tuberculosis of the lachrymal canal to tuberculous disease of the nasal mucous membrane. This author found among 4200 patients in the eye clinic of Würzburg 5 cases of tuberculosis of the lachrymal canal and 9 cases of tuberculosis of the conjunctiva and cornea. In all 14 patients a tuberculous nasal trouble was present. Seifert concludes from this that tuberculosis of the lachrymal sac is almost invariably caused by a similar affection of the nasal mucous membrane, and is generally secondary. Seifert's figures, however, do not tell us in how many cases of nasal tuberculosis the extension of the disease to the eye and its adnexa takes place. To elucidate this latter question, the material of a nose clinic is more fitted.

During the six months between October, 1900, and March, 1901, we have observed 9 cases of tuberculosis of the nasal mucosa (8 female, 1 male) in the University Polyclinic for Diseases of the Ear, Nose, and Throat. Of these 9 patients, 5 showed disease of the lachrymal passages or of the eye and its surroundings, while in 4 no ocular anomaly could be found. In the first 5 cases, the etiological connection between the disease of the nose and the eye could be assumed with certainty, and the eye was always secondarily affected. In more than one-half of these cases the eye was affected, a proportion which suffices to show the great danger which nasal disease has for the eye.

---

[1] From the University Polyclinic for Diseases of the Ear, Nose, and Throat in Breslau.

As regards the kind of nasal affection, 4 of our patients suffered from a typical granulation tumor of the inferior turbinate and the septum, and in 1 there was a lupus nodule on the membrane of the turbinate. The ocular lesions were more manifold and varied in severity.

Case 1.—Tuberculosis of the nasal mucous membrane, of the soft palate, and of the epiglottis. Tuberculosis of the left lachrymal canal and left conjunctiva. Inflammatory hyperplastic changes in the right conjunctiva.

The patient, a girl of fifteen, was admitted to the Eye Hospital, October 15, 1900, on account of a lachrymal fistula on the left side. Slight hereditary taint. The patient complained of interference with nose-breathing since February. Recently her general nutrition has failed, and she has suffered severely at times from coughing.

On admission, poorly nourished, anæmic girl. Over right apex, accentuated respiration and slight dulness. In left eye, fistula in the region of the lachrymal sac and a large, round, grayish area about 1 *cm* in diameter, is situated in the lower, inner quadrant of the eyeball. There is an opacity with several yellowish foci in the lower part of the cornea and a number of grayish-yellow nodules around the border. In the upper part of the conjunctiva there are a number of grayish nodules, otherwise the conjunctiva presents the clinical picture of trachoma. The conjunctiva of the lids of the right side presents similar changes, but the conjunctiva of the eyeball is practically normal. The right lachrymal canal is unaffected. The nodes in the neck are enlarged on both sides.

Nose.—Breathing interfered with on both sides. On the right side, the lower meatus is filled by a nodular, partly ulcerated granulating mass, apparently originating from the lower turbinate and adherent to the septum in its posterior part. On the left side there is a similar but smaller tumor.

Pharynx.—The right faucial pillars and surrounding parts of the soft palate are infiltrated, thickened, and pale. The surface is studded with small nodules, but without ulcerations. This lesion of the mucous membrane extends to the epiglottis.

Larynx.—The epiglottis is thickened, immobile, and covered with similar nodules. It obscures the laryngeal opening and hides the vocal cords. The patient is not hoarse, and it may be assumed that the vocal cords are not affected.

An excised portion of the area of infiltration on the left bulbar conjunctiva shows tubercular structure. Microscopically there are typical tubercular nodules with Langhans's giant cells. Transplantation into the anterior chamber of a rabbit produces tuberculosis. The pieces excised from the palpebral conjunctiva show uniform chronic inflammatory hyperplastic changes, not resembling trachoma or tuberculosis.

Local treatment of the eye with silver nitrate and iodoform salve was without much result. After four weeks the patient's general condition had improved to such an extent that energetic treatment of the nasal trouble could be begun. The granulation tumor was removed with moderate hemorrhage. Nothing was done on the left side. During the next four weeks both nasal passages were treated with lactic-acid tampons. In the middle of December, 1900, both sides of the nose were patent and the lower turbinates were of normal size. The mucous membrane was uneven, but there were no granulations. The infiltration of the right faucial pillar was diminished. During January and part of February the lactic-acid treatment was continued until no evidence of the tuberculous lesion in the nose could be made out.

The danger of fresh infection of the eye from the nose seemed now to be excluded, and on February 9th the right lachrymal sac was extirpated. It was found adherent to the surrounding tissues and the neighboring bone was carious. The walls of the sac were infiltrated with tuberculous nodules. The wound healed rapidly and was closed on March 5th. After the elimination of the lachrymal sac, the conjunctiva improved markedly. This improvement was, however, only of short duration, and in the beginning of March the infiltration again enlarged and an ulcer developed in the diseased part of the cornea. The changes in the right conjunctiva disappeared entirely, and on the patient's discharge the conjunctiva of the right eye was pale, with numerous cicatricial bands like healed trachoma.

In March, 1901, portions of the thickened epiglottis were removed. The mucous membrane of the arytenoid cartilages presented a few nodules, but the vocal cords were normal. The patient then went home, and has not since returned.

This patient was an emaciated girl with tuberculous changes in the upper respiratory passages and the conjunctivæ, with slight involvement of the lungs. Before treating the eyes, it was necessary to exclude the entrance of new infectious material from the nose. The disease of the pharynx and epiglottis was probably secondary. Energetic treatment of the nose resulted in marked improvement of the nasal condition and in amelioration of the condition of the pharynx.

After extirpation of the lachrymal sac, the inflammatory changes in the right conjunctiva ceased. Treatment of the left eye, however, was without result. It is questionable whether a complete recovery is possible without sacrifice of the eyeball. The recovery of the right eye is of great interest, as it was the beginning of a specific process which was arrested by eradicating the primary lesion in the nose.

Case 2.—Tuberculous granulation tumor of the left lower turbinate. Tuberculosis of the left lachrymal sac and tuberculosis of the left conjunctiva tarsi.

C. S., twenty-four years old. No heredity. Has been under treatment at the Clinic since 1897. At that time a protruding granulating mass was removed from the tarsal conjunctiva of the left upper eyelid, presumably of tuberculous nature. The left lower lid was at that time healthy, though there existed a slight eversion of the lower puncta with a slight muco-purulent secretion. The lachrymal sac was not treated, and no mention is made of an examination of the nose. The patient returned February 22, 1901, on account of a swelling in the left lower eyelid.

On admission, well-built girl of healthy complexion. No pulmonary lesion. The left upper lid shows a notch, the scar of the old operation. The lower lid is ectropionated in its outer part by the presence of an ulcer as large as a cherry-stone. The surface is uneven and partly grayish-red, covered with grayish secretion. A narrow passage leads from this ulcer under the lid to the region of the lachrymal sac. The lachrymal passage is somewhat stenosed. Right eye is normal. The patient does not complain of her nose, though respiration has been interfered with for some time.

On February 26th, an examination of the nose showed that the right side was normal. A granulating mass occupied the entrance to the left side. This growth was attached to the anterior half of the lower turbinate.

Diagnosis.—Tuberculous granulation tumor. The naso-pharynx and larynx presented no tubercular lesions.

As the connection between the conjunctival affection and that of the lachrymal sac was perfectly clear, the lachrymal sac was extirpated and the granulations of the lower lid excised. The tumor in the left nose was removed and showed, microscopically, typical tuberculous nodules, giant cells, but no caseation. The nose was subsequently treated regularly with lactic-acid tampons. The lachrymal wound healed primarily, and the conjunctival wound presented healthy granulations. The patient, unfortunately, had to leave on March 6th, before we could report a definite result of the treatment, though it can be assumed that a definite healing of the nasal lesion did not take place.

This was a case in a well-built, otherwise healthy individual; though the disease had existed for quite a long time—three years—the changes in the eye were not so extensive as in the first case. The case shows the intimate relation between diseases of the nose and eye and the futility of treating the latter alone. The ulcer on the left upper lid, which was treated three years ago, was surely tuberculous, just like the more recent one, which was secondary to disease of the lachrymal sac. The excision of the old ulcer was successful, but the primary focus in the nose was not treated. The transmission of the infectious material continued and produced the new ulceration in the lower lid.

Case 3.—Tuberculosis of the nasal mucous membrane of both sides. Healed left dacryocystitis. Tuberculous infiltration in the left lower lid.

F. G., seventeen years old, came to the Clinic January 28, 1901. She stated that she had suffered for some time from an eruption about the nose, and that recently the skin of the left lower eyelid had become affected.

On admission the patient was well nourished. Over right apex, diminished percussion note; vesicular, unchanged breathing without râles. About the right nasal entrance there is a severe eczematous condition with crusts. The skin of the tip of the nose is red and thickened with a few small nodules. The lower, anterior part of the right side of the septum shows a mass of granulations covered with crusts. The right lower turbinate is similarly affected, and the left lower turbinate is covered with crusts and granulations. In the naso-pharynx, on the right side, there are a few nodules. The skin of the lower lid is thickened, reddened, traversed by rhagades, and partly covered with crusts. A few small nodules are noticeable.

The left lachrymal canal is patent. A very fine fistula leads from the left lachrymal sac to the aforementioned diseased area in the lower lid.

As the lesion in the nose is surely a primary focus, treatment of the latter is at once begun. The granulations are removed and the lactic-acid tampons are introduced. After three weeks the granulations have all disappeared and the inflammatory changes in the lower lid have improved. Further treatment was not permitted by the patient.

The nasal condition in this case is similar to that in Cases 1 and 2. The lachrymal sac was affected, though its specific tuberculous character cannot be confirmed; nevertheless, the lachrymal canal served to transmit infectious secretion, and the fistula shows the connection between the cutaneous lesion and the sac. The disease, in this case, has extended in a different manner from that in Cases 1 and 2, and the eye itself remained intact.

Case 4.—Tuberculous granulation tumor of the nasal septum. Stricture of the left lachrymal canal. Phlyctenules in the left eye.

H. T., fifteen years old, came to the Dispensary October 14, 1896. The father had suffered from syphilis, the mother was healthy. In his eighth year, the left index finger was amputated, presumably on account of a tuberculous process. One year ago vegetations were removed from his throat. The patient has been unable to breathe freely through his nose for several weeks. An hypertrophy of the posterior tips of the turbinates and an adenoid remnant were found and removed. No evidence of tubercular disease was found. The patient felt comfortable till the end of

1897, when he complained of nasal occlusion. At that time rhagades and secretions were found at the introitus nasi. The right nose was completely occluded by a nodular tumor of gray color. The tumor was pedunculated and inserted on the septum at the level of the middle turbinate. The glands of the neck were enlarged. The posterior tips of the turbinates were hypertrophied. The tumors were removed and the specimens were very suggestive of tuberculosis.

In 1898, the patient suffered from pneumonia.

On August 16, 1899, a large tumor was found in the same location as the previous one and removed.

On December 6, 1899, the tumor had recurred, and a part of the cartilaginous septum, to which it was attached, was excised.

On February 11, 1901, the patient returned with the old complaint. There is a large perforation of the cartilaginous septum with granulating edges. A tumor arises from the posterior and upper margins of the perforation. This is removed and the nose treated daily with lactic-acid tampons.

At the end of April, 1901, the edge of the perforation is smoothly healed over. The lungs are normal. The patient is being treated in the surgical clinic on account of a tuberculous focus in the left hand.

The patient has suffered from recurring inflammations of the left eye. The examination in the eye clinic showed the presence of phlyctenules. The left lachrymal canal is freely passable. The phlyctenules healed, but after two weeks pain in the left eye is again complained of. The lachrymal canal is probed and a stricture found. The patient is still under treatment.

This case is especially interesting on account of the course of the nasal lesion. It shows that the usual methods of treatment—removal of the granulating mass and cauterization—are absolutely useless. The nasal disease progressed, and not till the treatment with lactic-acid tampons was instituted did the process come to a standstill.

As regards the disease of the lachrymal canal, we have probable evidence of a beginning tuberculous lesion. The appearance of the phlyctenules is very interesting. The fact that they appeared only on the eye where disease of the lachrymal passages existed suggests a connection between these two affections. Phlyctenules, as is well known, belong to the group of scrofulous diseases. In many cases of phlyctenules latent tuberculosis is suspected, though the eye disease itself shows no specific tuberculous properties. Our case was not a specific affection, though I think a similar connection existed as in Case 1, where infected lachrymal secretion caused the disease, which, while not directly tuberculous, nevertheless belongs to the group of scrofulous lesions.

Case 5.—Lupus of the nasal mucous membrane of both sides. Healed lupus of the tip of the nose. Left dacryocystitis.

C. D., forty-eight years old, came to the clinic January 11, 1898. The patient had been treated for years in the dermatological clinic on account of lupus of the external nose. At that time examination of the nose showed a deviation of the cartilaginous septum to the right, and the mucous membrane of the lower turbinate and of the septum on both sides was covered with small nodular tumors. These were removed in a number of sittings.

In January, 1901, the patient returned, after a long absence, complaining of the formation of crusts in her nose and tears in the left eye. The condition of the lower turbinates is practically unchanged.

A small perforation has formed in the cartilaginous septum. A dacryocystitis without specific tuberculous character was present. The treatment consisted in the use of lactic-acid tampons. The lachrymal symptoms were relieved. The formation of crusts was diminished, nevertheless the nasal mucous membrane still shows a number of small nodules.

Opposed to the preceding cases, the affection did not lead to tuberculous disease of the lachrymal passages, but produced the clinical picture of a simple dacryo-cysto-blenorrhœa. It can be assumed that this was secondary to the nasal affection.

I think these five cases well illustrate the various changes which follow tuberculosis of the nasal mucous membrane.

(1) There may be some dacryocystitis (Cases 4 and 5) without any evidence of a tuberculous lesion, with symptoms of disease of the lachrymal sac. This is surely the least harmful and the one most readily treated, though, according to Seifert, it is the primary stage of severer lesions.

In these cases, the causal connection is overlooked if the nose is not examined.

(2) An evident tuberculous disease of the lachrymal sac is present (Cases 1 and 2). In none of my cases does this appear isolated, and in all cases the disease had extended beyond the lachrymal passages. Seifert was able to collect five cases of isolated affections of the lachrymal sac.

(3) The conjunctiva and the cornea are affected by the transmission of infectious material if this does not cease at a certain time (Cases 1 and 2). This may be: (a) Of inflammatory nature (Case 1, right eye; Case 4, tarsal conjunctiva of both eyes), due to irritation of the secretion, but not to the specific action of the tubercle bacilli. Manifest disease of the lachrymal passages may be absent (Case 1, right eye); (b) of specific tuberculous nature, usually in the form of infiltrations on the conjunctiva, which may extend to the cornea. The infiltrations are usually situated in the neighborhood of the punctæ lachrymales (Case 1, left eye). They may, however, be situated at some distance (Case 2, external canthus). They usually communicate with the lachrymal sac by a fistulous tract.

(4) The secretion of the tuberculous lachrymal sac may leave the conjunctiva intact, but produces tuberculous lesions in the surrounding skin of the eyelids. In all cases, fistulæ are present showing the path of infection. Three of our patients did not remain sufficiently long under treatment for me to report the results. The other four were treated and observed for a long time and have remained under observation. I think they show the possibilities of our method of treatment.

In most cases, owing to the accessibility of the anterior part of the septum and of the lower turbinate, the granulation tumors can be easily removed by a snare or thermocautery and curette. Small foci not visible to the unaided eye remain and lead to relapse. In addition to this surgical procedure, cauterizations have been tried, especially with lactic acid, which has been specially recommended in laryngeal troubles.

Jellinek, in 1885, called attention to the fact that lactic acid must act for a certain length of time to be of benefit in the nose. This can best be accomplished with tampons which remain in place for hours. I came to very much the same conclusions from the unsatisfactory results which I had obtained by previous methods of treatment,— removal of granulations, cauterizations, cauterization with not very concentrated solutions of lactic or chromic acids—and I was induced to increase the concentration of lactic acid and the frequency and length of application. I found that tampons soaked in 80 % lactic acid could remain in the nose for three hours without causing harm or annoyance to the patient. Moreover, the tampon treatment may be continued for several weeks, though it is better during this time to vary the strength of the solution used. It seems to me of value to add iodoform paste to the acid.

It is necessary not only to apply the tampon to the diseased area, but also to the surrounding tissues. Very deep ulcerations should be treated from time to time with pure lactic acid. The result of this treatment is an unusually free mucous discharge with the formation of a thick crust, which should be kept in check by applications of boric salve.

On the day after cauterization with concentrated lactic acid (80 %) the diseased parts were found to be covered by a thick membrane; the sound mucous membrane was swollen and pale. Lactic acid does not affect the skin of the introitus if the latter is sound.

Applied to two patients suffering from lupus changes on the outer side of the nose, the disease process showed a very violent inflammatory reaction, which was quite painful, but rapidly disappeared. This confirms the well-known observation that lactic acid attacks only diseased skin and mucous membrane.

I removed the membrane daily and repeated the cauterization. In one case, where the tumor was not removed before the cauterizations, the latter being applied from the very beginning, the final result was obtained in about the same length of time as in the combined treatment. As regards the results of our treatment, we must distinguish between temporary and permanent cure. The first was excellent in all of my cases. The granulations and ulcerations rapidly disappeared and no signs of specific tubercular disease could be found. I do not, however, think that these can be taken for permanent cures, as the results of other observers show. I would therefore like to emphasize a systematic treatment carried on over a long period of time. I would recommend, in some cases, treatment of the mucous membrane for several days in each month, even if no macroscopic lesions have returned.

Finally, it seems to me that in a patient with nasal tuberculosis, but otherwise healthy, if the nose be treated thoroughly for a sufficient length of time, the prognosis is not unfavorable. Untreated, there is danger for the patient, as the nasal secretion containing the bacilli may travel by way of the lachrymal passages to the eye and by the nasopharynx to the larynx and lungs.

REPORT OF THE TENTH MEETING OF THE GERMAN OTOLOGICAL SOCIETY, HELD IN BRESLAU, MAY 24-25, 1901.

By Dr. MAX GOERCKE, Breslau.

Translated by Dr. Richard Jordan, New York.

FIRST SESSION, FRIDAY, MAY 24TH.

CHAIRMAN: HABERMANN, GRAZ.

Business Session.

The Chairman opened the meeting at 10.15 A.M. In a brief address he drew attention to the important position that Breslau held in the history of otology, due to the skill and labor of Middeldorpf, Voltolini, Gottstein, and Jacoby, and expressed thanks to the magistrate of the city for having placed commodious quarters at the disposal of the society.

He was followed by Mayor Bender, who welcomed the congress in the name of the city.

Councilman Steuer then addressed the meeting in his capacity as commissioner for the city hospitals. He referred to the fact that Breslau had been the first community in Germany to establish a special department for ear patients, and that, in spite of the financial burden which the acceptance of Jacoby's legacy of ten years ago had imposed upon her, she had proceeded to fully equip and maintain the department for ear, nose, and throat diseases in the All-Souls Hospital. The speaker invited the congress to inspect this department on the following day.

Kümmel (Breslau) welcomed his colleagues in the name of the local committee.

Speaking of the events of the past year, the President first mentioned the appointment of Körner (Rostock) as Professor

Ordinarius of Otology by Duke Johann Albrecht of Mecklenburg-Schwerin. A motion was made by ZAUFAL (Prag) to send an address of thanks to Duke Johann Albrecht, and was passed unanimously.

The PRESIDENT then spoke of the loss that otology had suffered in the past year by the death of Kuhn (Strassburg), praising his activity as a member of the executive committee and his successful labor for the advancement of science.

The city of Trier was selected as the place of the eleventh meeting in 1902. Thirty-one new members were admitted, the total membership now being two hundred and sixty-nine.

Kretschmann (Magdeburg) was elected a member of the executive committee. The motion made by HARTMANN (Berlin) to establish a library was passed.

Siebenmann (Basel) was elected President for the following year and Bürkner (Göttingen) Vice President.

Scientific Session.

Addresses were made by Drs. JANSEN (Berlin) and BRIEGER (Breslau), introducing a general discussion on **otogenous sinus-thrombosis.**

1. JANSEN (Berlin): **Report on our present knowledge and views on otogenous sinus-thrombosis.**[1]

JANSEN (Berlin) discusses first the pathological basis of otogenous pyæmia. Besides the septically disintegrated, obstructing thrombus we have to consider the firm and solid thrombus, and the parietal thrombus. Periphlebitis also, as Jansen explains, may easily bring about pyæmic conditions, while the ordinary extradural abscess is not attended with fever. Periphlebitic abscesses need not be very large nor under high pressure to cause fever.

The speaker then dwells upon the question whether metastatic pyæmia could originate directly from an empyæma in the mastoid process, either by direct resorption of septic material or by an inflammation of the small veins (osteo-phlebitis). The speaker, formerly inclined to interpret some of his favorable cases in such a way, has gradually been led by his experience to abandon this theory. In every case of pyæmia in his own observation he has been able to find evidence of a diseased sinus. The conditions of the mastoid process, as well as of the dura mater, are very unfavorable to resorption. This explains why such abscesses, even very large ones, in adults are never accompanied with high fever, rarely with any fever at all — except in the first stage of an acute virulent mastoiditis. Young patients, however, react with fever more easily, and in infants and very small children the direct transition of staphylococci, etc., from a purulent mastoid focus into the blood has been repeatedly demonstrated.

---

[1] The ARCHIVES are indebted to Dr. Jansen himself for the following elaborated abstract of his address.

Koerner has collected numerous cases from literature (about sixty), purporting to show that metastatic pyæmia could develop, without any affection of the sinus, from osteo-phlebitis alone. When we analyze his statistics critically we will find the evidence insufficient to support his conclusions. Fifteen to seventeen cases are to be eliminated in which the presence of sinus-thrombosis or perisinuous abscesses was established. In fifteen of the twenty-six cases operated on the operation was insufficiently described or not thoroughly executed. These cases fail to inform us as to the presence of a perisinuous abscess. Sixteen cases recovered without operation—a group of cases which afford ample opportunity for speculation. Yet it is evident that these cases—themselves in need of a correct explanation—are not very effective arguments. In six of the operative cases the mastoid process was found perfectly healthy. How can osteo-phlebitis originate in a normal mastoid? In other cases pyæmia set in a long time after the operation, or continued long after a negative operation. The autopsy was incompletely performed or insufficiently described in 80% of all cases. In not a single case is the condition of the jugular bulb distinctly stated,—and yet such a statement is indispensable. Thus only a paltry residue remains of the great number, and even this will not stand severe criticism. It may be noted that about 25% were due to chronic suppuration, that 25% died, and that from 20 to 25% showed metastatic foci in the lungs. It follows that the frequency of such a pyæmia cannot be ascertained from the reports of cases recorded in literature. Following Leutert's example, authors have become decidedly more sceptical in the interpretation of their cases.

In going over his own material Jansen states that in sixty-three cases of pyæmia he failed only four times to prove the presence of sinus-thrombosis. In these four cases, however, there were more or less severe perisinuous affections. Two cases of sinus-thrombosis did not present any pyæmic symptoms whatsoever; in three there was only very slight fever; in one, high pyæmic temperature without metastases, and seven cases of acute otitis media developed pyæmia with metastatic muscular and joint affections. These ten to thirteen cases present the clinical picture of osteophlebitis as described by Koerner and three show still less conspicuous symptoms. But in all these cases the operation revealed positively a thrombosis of the sinus. On the other side there are three cases of severe pyæmia caused either by parietal thrombosis or periphlebitic affections. All these considerations prove that osteo-phlebitic pyæmia does not deserve the position assigned to it by Koerner. If Koerner says that pyæmia without sinus affection seems to be rarer than pyæmia with sinus-phlebitis, the speaker would rather say that if it exists at all it must be *very* much rarer and of no practical importance.

Metastatic affections of muscles and joints do not exclude—as Koerner wants us to believe—the diagnosis of sinus-thrombosis; on the contrary, they prove—according to the speaker's experience—the presence of an affection of sinus or jugular bulb. Literature as well as personal observations fail to confirm the statement that osteo-phlebitic pyæmia could be differentiated in any way from otogenous sinus-phlebitis—by its clinical course, the character of its metastases and complications, or the prognosis. Sinus-phlebitis is always easily recognized by the careful observer, while a periphlebitis of the bulb escapes our observation in all cases. We would not be justified, however, to regard the latter affection as improbable or as a non-existing stage of pyæmia. Frequently in acute otitis the bulb is in greater peril than the sinus,—as in inflammations of extreme virulence, in delayed spontaneous perforation, under favorable anatomical conditions, protruding jugular fossa with extended apposition of the bulb to the tympanic cavity, etc. In a case of severe septicæmia the speaker found the upper part of the jugular necrosed as early as on the seventh day after the first appearance of the fever and the acute influenza-otitis, while the sinus was absolutely intact. The phlebitic processes of the bulb present as a whole a graver prognosis as to the systemic infection than those of the lateral sinus; but at the same time the conditions for a spontaneous cure of the periphlebitic process are more favorable on the bulb than on the sinus—presumably on account of the rapid improvement in the intratympanic inflammation. In all cases of pyæmia where the sinus appears healthy, particularly in acute otitis, our first thought must be of a phlebitis of the bulb. In the speaker's own material, with a preponderance of acute otitis at the ratio of 16:11, primary phlebitis of the jugular bulb is the more frequent.

LIGATION OF JUGULAR VEIN.

In parietal thrombosis and in obstructing thrombi that have not yet disintegrated spontaneous healing is possible after evacuation of the perisinuous collection. Observations of this kind are very numerous. If the thrombus is disintegrated, however, its elimination has to be attempted by incision of the sinus, or by ligation of the jugular vein, or by both operations combined. Judging from the reports published, the ligation of the jugular vein in pyæmia shows better results than operation on the sinus alone. In the synoptical report by Viereck of ninety-four cases in which no evidence was present of an affection of the jugular vein forty were ligated and fifty-four were operated only on the sinus. Of the forty ligated cases six, *i. e.*, fifteen per cent., died, and of the thirty-four that recovered six developed metastatic complications. Of the fifty-four cases operated on the sinus, thirteen, *i. e.*, fourteen per cent., died. Of the forty-one cured cases sixteen had long-continued pyæmic fever, eleven had metastatic abscesses. The numerous recoveries after incision of the sinus alone certainly go to prove that ligation is frequently unnecessary. The speaker's opinions about the different operations and their indications may be tabulated as follows:

Ligation of the jugular vein is done

I. As the *first step* of the operation
  1. in undisputed cases of jugular phlebitis;
  2. in severe sepsis (or septicæmia).

II. After *exposure* of the sinus
  1. if the sinus appears healthy with no perisinuous affections, where the pyæmia shows rigors and marked oscillations of temperature;
  2. in periphlebitis and parietal thrombosis under the same conditions.

III. After *incision* of the sinus
  1. if the septic thrombus is or was situated in the immediate neighborhood of the bulb;
  2. if, after the incision, the rigors do not cease, nor the temperature decrease materially.

The sinus is *opened*

1. at the evidence of a septically disintegrated thrombus ;
2. in gangrene of the sinus wall ;
3. in repeated rigors, marked oscillations of temperatures, and poor general condition ;
4. neuritis optica.

The evidence of an affection of the sinus wall or of a solid thrombus does not necessarily call for an operation on the sinus or jugular vein, for these affections very frequently recover spontaneously. The character of the systemic infection is an essential factor.

The co-existence of a diffuse purulent meningitis is at the present time a contraindication to sinus operations. The mere evidence, however, of pus or cocci at the lumbar puncture should not deter us from operating.

Agreeing with von Bergmann, but disagreeing with Leutert and others, Jansen rejects the incision of the sinus for therapeutic reasons, and particularly for diagnostic purposes as long as a good current of blood is circulating through the vessel. Accordingly, he prefers the puncture to the incision, although the puncture is convincing only in the case of a positive result. Whiting's method of ascertaining by digital compression whether the bulb is thrombosed or not is declared permissible, but neither advisable nor reliable.

Guided by the principles, as stated above, not to ligate the jugular vein immediately in every case of pyæmia where we find only a perisinuous abscess or a parietal thrombosis, and not to ligate at all in cases where the circumscribed focus in the sinus can be thoroughly exposed, Jansen has attained the following results in the last years :

25 cases of sinus or jugular thrombosis with	3 fatal = 12 %	and 22 recov.	= 88 %
of which 3 were operated on mastoid only	—	3 "	
" 22 " on sinus or jugular vein	3 fatal = 13.6 %	" 19 "	= 86.4 %
of the latter 10 on the sinus only	—	10 "	
" 12 on jugular vein and mostly on the sinus	3 fatal = 25 %	" 9 "	= 75 %

Of the ten cases operated on the sinus, all recovered without the fever continuing after the operation for any length of time.

Altogether, Jansen has performed and partly reported :

50 operations on sinus or jugular vein with................ 35 recov. = 70 %
of which 30 on sinus alone " .... 22 " = 73 %
" 20 on jugular vein and sinus " .... 13 " = 65 %

2. BRIEGER (Breslau). **Report on the present status of otogenous pyæmia.** The pathogenesis of otitic pyæmia varies in different cases. Usually, there is a thrombo-phlebitic process in the lateral or sigmoid sinus or in the jugular bulb, but cases do occur where in undoubted otogenous pyæmia all the sinuses show a normal condition. In two such cases of Brieger's the metastatic foci were so recent that recovery of the sinuses from the thrombo-phlebitic process was not to be thought of.

Pyæmic symptoms (fever, metastases) may originate directly from the ear by the formation of bacterial emboli. Osteo-phlebitis, however, can no longer be sustained as a special clinical form of otitic pyæmia. The pyæmic symptoms, in cases where at the operation the sinus appears normal, are frequently accounted for by a parietal thrombus.

Etiology: Most frequently streptococci are found ; occasionally the staphylococcus, the pneumococcus, and Friedländer's bacillus. The number, distribution of germs, and their virulence within the thrombi vary considerably. The virulence does not always correspond to the severity of the pyæmic symptoms. Sometimes the dissemination of thrombotic particles leads to simple infarcts, sometimes to the formation of metastatic abscesses. The pyæmic symptoms may exacerbate and new metastases may occur after an interval of weeks and even months.

Diagnosis: As high temperatures for several days are occasionally seen in uncomplicated suppurations, the diagnosis of otogenous pyæmia or sinus-thrombosis cannot be made on the strength of such a symptom. Only the typical pyæmic temperature chart is conclusive, although in undoubted pyæmia it may change considerably, and even be completely absent.

The speaker then discusses the examination of the exposed sinus before and after incision ; he calls attention to the importance of carefully inspecting the internal wall, and reviews the different methods for rendering the affected portion of the sinus bloodless.

Treatment: The operation for sinus-thrombosis is contra-indicated only where the general condition of the patient prohibits surgical treatment (as in severe diabetes). The object of the operation is the occlusion of the sinus peripherally and centrally.

Hence the removal of the firm ends of a thrombus is not advisable. The method frequently employed in parietal thrombosis to ligate the jugular vein, transforming the parietal into a complete thrombosis and afterward incising the sinus, is open to objection and not free from danger. The ligation of the jugular vein to prevent the dissemination of infected particles is frequently unnecessary, because a firm adhesion of the walls takes place between the lower end of the thrombus and the next tributary vein; sometimes it is harmful, because it causes the thrombosis to expand over portions of the venous system previously unaffected. If the phlebitis spreads to the jugular vein, however, the ligation of the latter is the only reliable way of preventing the downward extension of the phlebo-thrombosis. Ligation should be followed by the splitting of the portion between the ligatures.

Demonstration of fever charts, specimens, and drawings of sinus-thrombosis.

Discussion: KOERNER (Rostock) admits that osteo-phlebitis is rarer than he had formerly thought it to be, but he insists on the possibility of pyæmic fever and peripheral metastases caused merely by a disease of the bone. A larger number of reliable clinical and anatomical observations will enable us in due time to decide this much disputed point.

LEUTERT (Königsberg): The practical importance of osteophlebitic pyæmia is infinitely small. If the autopsy in a case of pyæmia fails to reveal sinus-thrombosis, a microscopical examination of the different sinuses should be resorted to. Leutert believes that we would rarely err in diagnosing sinus-thrombosis in adults, where a continuous fever exceeds 39° C. (102° F.) for several days; in such cases we must needs be guided by somewhat diagrammatic rules; besides, these very cases with a continuous high temperature are most dangerous. Leutert does not recognize the possibility of a non-infected thrombus. If in pyæmia a thrombus has been found, it should be removed, even though we may not be certain of its being the cause of infection. If fever is present after the *acute* inflammatory symptoms have passed, the sinus has to be exposed, even when the morbid changes found in the mastoid bone are very slight. Leutert is opposed to the assumption that thrombosis of the jugular bulb could originate directly from the adjoining tympanic cavity; he believes that the thrombus formation always starts from a place where the pus finds no outlet—that is, at the sinus.

Regarding **the ligation of the jugular vein**, Leutert now thinks that it ought to be done in every case of sinus-thrombosis and prior to the operation on the sinus, as it is impossible to foretell when the dissemination of the thrombus will occur. If there are indications that the thrombus extends beyond the facial vein, the jugular ligation should be done below, otherwise as high up as possible. Incision of the sinus is to be preferred to the puncture ; profuse hemorrhage might necessitate a delay of one to two days. In opposition to Brieger, Leutert denies that packing could produce obstructing thrombosis.

PANSE (Dresden) relates a fatal case that would have been taken for osteo-phlebitic pyæmia if a diligent search had not discovered a disintegrated thrombus in the bulb. Panse regards the direct infection of the bulb from the tympanum as very probable.

HABERMANN (Graz) cites a case described by him in the *Handbuch für Ohrenheilkunde* where, in spite of a large perforation in the drum membrane, the jugular bulb was found diseased.

DENKER (Hagen) mentions a case of **influenza-otitis** where fever and pain in several joints set in on the seventeenth day of the otorrhœa. After several metastatic abscesses in shoulder and thumb were incised, the fever disappeared. Denker is inclined to interpret his case as one of osteo-phlebitis.

HOFFMANN (Dresden) states that in his case, referred to by Jansen, the diagnosis of thrombo-phlebitis was made and the ligation omitted on account of alarming symptoms owing to the narcosis.

ALT (Vienna) agrees with Jansen that the ligated portion of the jugular vein should be excised, and mentions a case where the secondary infection of the ligated jugular vein was followed by the formation of a perijugular abscess.

SCHEIBE (Munich) : There is no doubt that isolated thrombosis of the jugular bulb occurs in acute otitis media, and more particularly in influenza-otitis ; the influenza bacillus is very apt to affect the blood-vessels and to cause necrosis. Scheibe relates a case of bulbo-thrombosis in his practice.

VON WILD (Frankfort-on-the-Main) thinks that the speakers have exaggerated the importance of sinus-thrombosis as the principal cause of otogenous pyæmia. He considers it more correct to speak of an otogenous blood-infection, comprising bacteræmia, toxæmia, and pyæmia. In opposition to Leutert, who identified sinus-thrombosis with pyæmia, Von Wild has no doubt that pyæmia can develop without thrombosis, analogous, *e.g.*, to the development of septicæmia in tonsillitis; besides, it is possible experimentally to produce pyæmia by injection of bacilli. Thus otogenous pyæmia might be explained by a direct absorption of pus from the ear, especially in cases where the pyæmic symptoms appear early. In case of an early operation, therefore, the evacuation of the primary focus will be sufficient; if, in spite of this, the infection should progress, it will be time enough to then operate upon the sinus.

PREYSING (Leipzig) regards bulbo-thrombosis not as rare as Leutert does, but thinks that, owing to its situation, it is frequently overlooked. Leutert's argument for ligation prior to the sinus operation because of a suppuration of the jugular stump in one of his cases does not seem well founded, as the ligation in most cases of sinus-thrombosis leads to an infection of the stump. A certain routine is indispensable, but Leutert goes too far in declaring that the rise of temperature above a certain limit is conclusive evidence of the presence of sinus-thrombosis. On the other side, Leutert himself concedes that sinus-thrombosis occurs without fever. Preysing distinguishes three forms of thrombi: (1) The solid, organized thrombus, frequently without fever. Here the ligation of the jugular vein would be unwarrantable. 2. The thrombus disintegrated in the centre and solid at both ends. In this case we may wait with the ligation unless the fever continues or sets in after the sinus operation. 3. The thrombus extending into the jugular vein. Here the ligation is indicated and should precede the operation on the sinus. Preysing ligates in the middle of the neck, where surgeons ligate the carotid; he ligates the facial vein separately (and the ligation of the external jugular should not be omitted.—ED.).

Cases are reported by EHRENFRIED, SCHWABACH, WALLISEK, DEUTSCHLÄNDER.

JANSEN, in the discussion, said that he was pleased to see that the differences of opinion on this subject had largely disappeared. He agrees with Leutert that the cases with a continuous high temperature are especially severe; but in these cases it is difficult to exclude meningitis (not even the presence of cocci in the spinal fluid, as elicited by lumbar puncture, being sufficient evidence of the presence of an incurable meningitis).[1]

That injury to the sinus is not without danger is shown by a case in Jansen's practice where such an injury to the healthy sinus was followed by fatal pyæmia. While Leutert pleads for ligation in every case, and for the removal of every thrombus, Jansen thinks it first necessary to prove that the thrombus is an infected one, for thrombosis could develop without the immigration of cocci. The principle of surgery, to avoid everything unnecessary, should never be lost sight of. If a solid thrombus is not accompanied by fever, an operation is not indicated; such cases recover without sinus-operation. He must differ from Leutert's opinion, that all thrombi of the bulb originate in the sinus. The bulb is frequently separated from the tympanum by an extremely thin bone wall, and cases with gravitations at the bulb are by no means rare. Jansen is not inclined to abandon the exploratory puncture of the sinus; he is not at all convinced that it could be dispensed with, and he denies that it leads to diagnostic errors. As to the technique of ligation, Jansen agrees with Preysing.

---

[1] See paper by Jac. Cohn in this number.—ED.

BRIEGER (in closing the discussion): Leutert will hardly be able to uphold his absolute opposition to otogenous pyæmia without thrombosis. Cocci can enter the circulation from the ear as well as from other parts of the body. This has been confirmed by experimental investigations. The two cases mentioned by Brieger in his paper will be reported in detail. They are above criticism. Under certain conditions the diagnosis is very difficult; our knowledge of the clinical symptoms and their signification is in need of further advancement, as on this subject no aid is to be expected from bacteriology. Brieger considers the routine practice, advocated by Leutert, as directly harmful; it would lead to an unnecessarily frequent exposure of the sinus, and such exposure is never without danger. That the ligation of the jugular vein may facilitate the progress of the thrombosis is illustrated by some striking observations in Brieger's practice, which have the value of physiological experiments. In one case, the jugular vein was found patent at the time of its ligation; and at the post-mortem, forty-eight hours later, the whole vein was filled with thrombi. It is not possible to produce a thrombus by an incision of the sinus, but the introduction of a tampon into the sinus invariably leads to thrombosis.

SECOND SESSION, MAY 24TH, 2.30 P.M.

3. ALT (Vienna): **Musical hearing and its impairment.**

Alt has made a number of experiments to ascertain to what extent the musical hearing may be impaired by disorders of the sound-conducting apparatus. He tried to bring about those conditions of the ear which present themselves when the drum membrane is pressed inward (as in middle-ear catarrh). With a Siegle's speculum he forced air into the external meatus and tested the perception of the sound of tuning-forks transmitted by bone-conduction (to insure a uniform duration and intensity of vibration the forks were excited by electricity).

He found that the tone of a fork of 32 v. d. ceased to be heard, but that an overtone (harmonic) of varying pitch was heard (32, 196, or 280 v. d.). If the pressure in the meatus was increased, the overtone disapppeared also upon application of a fork of 64 v. d., the twice-marked octave (256 v. d.) (C^2) appeared, to disappear again with increased pressure. When two forks were applied simultaneously (32 and 256 v. d.), the lower tone disappeared, the higher one was diminished. The experiments show that even a moderate inward-pressure of the tympanic membrane may considerably impair tone perception. The question arises, whether the diminished perception of the lower tones is due to great tension of the chain of ossicles—*i. e.*, to impaired sound-conduction or to a change in the hydrostatic pressure in the labyrinth caused by the sudden inward-pressure of the footplate of the stirrup. The latter assumption is correct, for at high pressure the perception of the overtones also disappears, the ear becoming totally deaf. A moderate increase of the intralabyrinthine-pressure paralyses certain fibres of the membrana basilaris so that low notes cannot be heard. As to the function of the chain of ossicles, Alt favors Zimmermann's supposition that it constitutes a damper and regulator of the intralabyrinthine pressure. The regulating apparatus fails to work properly in middle-ear diseases, and every loud sound transmitted produces—as in the experiment — an increased pressure in the inner ear. The weight of an exudation against the round window also increases the pressure in the labyrinth; in the same way contraction of the tensor tympani muscle dininishes the hearing of deeper tones. In addition, Alt explains the conditions which cause diplacusis, and relates in detail a case of diplacusis in a musician.

Discussion : DENNERT, BERTHOLD, PANSE, EHRENFRIED.

4. DEUTSCHLÄNDER (Breslau) : **Demonstration of a case of purulent otitis media with parotid-abscess, extradural abscess on the lateral sinus and on the jugular bulb, gravitation abscess into the atlanto-occipital joint.**

Some time after a radical operation, Deutschländer's patient showed symptoms of an inflammation of the labyrinth. As the ear continued to discharge, the sinus was exposed and a perisinuous abscess found. The whole mastoid process was removed with exposure of the facial nerve. On pressure against the infiltrated jugular region, pus appeared in the wound from the direction of the bulb. Deutschländer, in order to evacuate the abscess thoroughly, entered deep into the fossa pterygo-maxillaris, reaching the spinal column after the removal of a part of the occipital bone.

Patient recovered.

5. L. WILLIAM STERN (Breslau) : **Demonstration of a continuous bottle-tone series.** This apparatus, originally designed by Stern to demonstrate the sensibility for tone-differences, seems well adapted to serve as a substitute for the continuous fork-series from which it is distinguished by the following qualities : 1. It is in reality a continuous tone-series which can be run through, from one end to the other, without interruption from one tone to the other. 2. All tones can be produced, which differ only by a single vibration or even a fraction thereof. 3. Every tone can be sounded for any length of time and with an even intensity. 4. Even the deep tones are distinctly heard throughout the testing room. At present the apparatus covers only the tone-range from 100 to 1000 vibrations, but this is the region containing Bezold's "sixth," which is considered practically so important. Its limits may be extended later. The tone is produced by the blowing over bottles with a pair of bellows ; its variation, by the rise and fall of water from below, regulated by a special contrivance. The speed of the tone-variation is in proportion to the speed of the revolutions of a crank which controls the rise and fall of water in the bottles.

Discussion :

BERTHOLD : An advantage of this apparatus is the uniform intensity of the tones produced. In weighted forks the tones become more feeble when the weights are lowered. The difference in the intensity of tuning-fork tones is very considerable.

DENKER (Hazen): The apparatus will not be of great practical value before the upper and lower tone-limits will have been added to it. Besides, the tones do not seem to be free from harmonics. Have they been tested in this direction ?

STERN : No; but Helmholtz and Stumpf have authoritatively stated that these bottles give tones free from harmonics. These, if present at all, are so feeble, that they can be neglected for all practical purposes.

PANSE (Dresden): The apparatus is well adapted to determine whether higher tones are heard better than lower ones.

DENNERT (Berlin) thinks that a continuous tone-series could be constructed more easily and more economically by means of sirens.

STERN : Sirens are very rich in overtones and therefore not appropriate for testing purposes.

6. PETER (Breslau) and HINSBERG (Breslau): **Demonstration of plate-models to illustrate the development of the nose of vertebrate animals.**

The models are made after Dorn's method of plate-modelling.

7. BERTHOLD (Königsberg): **Demonstration of an apparatus for the vaporization of the nasal mucous membrane.**

With this apparatus (made by Hahn and Loechel in Danzig) temperatures exceeding 100° C. can be generated. Its application produces a fibrinous exudation of the mucous membrane, and a new healthy membrane forms in the place of the destroyed one. According to the effect either of the escaping steam or of the heat only the treatment is called Atmocausis or Zestocausis.

8. SCHEIBE (Munich): **Demonstration of a knife for the removal of the hyperplarstic ridges in lateral pharyngitis.**

A blunt-pointed bistoury with a short blade, bent slightly on the flat. While an assistant depresses the patient's tongue, the lateral ridge is grasped with a forceps and cut off from above downward.

9. KAYSER (Breslau): **Demonstration of an unusually large tonsillar calculus.**

The concretion was removed from a boy twelve years old; it was the size of a large olive.

10. KAYSER : **Demonstration of a patient with an ulcer of the external meatus.**

The ulcer is located at the junction of the cartilaginous and osseous meatus and is walled in by thickened edges. In the secretion tubercle bacilli were found.

11. BRIEGER (Breslau): **Demonstration of a patient with primary tuberculosis of the petrous bone.**

Girl, eight years of age, showed symptoms of an empyema in the mastoid antrum while the tympanum was always free from secretion. *Operation :* Antrum and mastoid cells filled with granulations. The latter had penetrated the tegmen to the dura, covering it in a thick layer. Microscopical examination of the granulation-tissue showed numerous tubercles with cheesy degeneration. The ear has recovered completely.

12. BRIEGER: **Demonstration of an anatomical specimen from a case of labyrinthitis.**

Sudden deafness after influenza-otitis. A few months later, death from tubercular meningitis. Microscopic examination reveals a complete destruction of the nervous structure by the formation of osseous and cicatricial tissue in the cavities of the labyrinth.

13. GOERCKE (Breslau): **Lantern demonstrations.**

a. Two cases of fibro-sarcoma of the auditory nerve with atrophy of the nerve fibres of the ganglia in the canalis spiralis and of Corti's organ.

b. Histological pictures of aural polypi.

Discussion:

KÜMMEL (Breslau): What Goercke demonstrated as glands in one of his sections are not glands, but depressions of the epithelium. The existence of glands in the tympanum is very doubtful.

GOERCKE: When the depressions of epithelium subdivide and widen, when they show a separate fundus and duct, when—above all—mucus-secreting cells appear in the fundus,—in short, when they show all the characteristics of glands, they have to be regarded as such. Glands have been found in the tympanum by von Troeltsch, Wendt, Krause, Politzer, and others. Goercke considers the presence of glands in his specimens as indisputable.

HABERMANN (Graz) asks whether in the case of follicles in an ear-polyp general lymphomatosis had been present.

GOERCKE: No. The polypus was located in the region above the membrana tympani where follicles in the normal mucous membrane have been found by W. Krause and Nassiloff.

14. KÜMMEL (Breslau): **Lantern demonstration** of a section showing the progress of middle-ear inflammation through the bone toward the sinus caroticus.

End of session 4.30 P.M.

THIRD SESSION, MAY 25TH, 9.15 A.M.

15. PANSE (Dresden) reads the report of the commission on notation of hearing tests.

16. DENKER (Hagen): **The ear of the Monotremata from a phylogenetic point of view.**

BONE: In opposition to Sixta's statement Denker has found that the monotremata do not possess an os quadratum; he is also convinced that the fenestra ovalis is enclosed entirely by the petrous bone, while Sixta places the vestibular opening in the suture of the oto-sphenoid and pleuro-occipital bones. Denker contradicts the same author's statement that the monotremata had the same osseous labyrinth as the sauria. Denker found no sutures in osseous labyrinth and believes it to be encased by a single bone, the os petrosum. The *cochlea* is somewhat similar to the saurian cochlea inasmuch as it is less convoluted than in any mammal. The presence of Corti's pillars and Corti's canal, however, reminds one of the mammalian cochlea. Denker found a lamina spiralis only in echidna, not in ornithorhynchus. *External Ear:* both representatives of the monotremata lack an osseous meatus but possess an auricle, though in the most simple form possible, thus showing the same development of the external ear as the mammalia. (The sauria have no external ear.) The *membrana tympani* consists of three layers (the sauria have no membrana propria) and is divided into the pars tensa and the pars flaccida; the latter, in echidna, is composed of muscular elements. The membrane is stretched in an annulus tympanicus which is attached to the petrous bone by connective tissue. There are three *ossicles*, but their form and connection remind one of the saurian columella. Malleus and incus are so firmly connected by syndesmosis or synchondrosis that they act as a unit. The place of the stapes is taken by a columella fixed into the vestibular opening by connective or cartilaginous tissue. Instead of the *tympanum* there is only a shallow groove in echidna (fossa tymp.); in ornithorhynchus even the osseous frame of the median wall of the tympanum is missing. Both representatives of the monotremata have no stapedius muscle, like the sauria, but they possess a m. tensor tympani, which is found in mammals exclusively.

Eust. Tube: In ornithorhynchus a broad communication exists between pharynx and tympanum; in echidna there is a cartilagino-membranous tube. This form is occasioned by the mode of life of the ant-eater, which causes a prolongation of the palate and a backward displacement of the naso-pharynx. A crista vestibuli is found in echidna only, a fossa subarcuata in ornithorhynchus only; a meatus acusticus int. only in the former, the latter having but a shallow fossa auditoria. Résumé: The organ of hearing of the monotremata, on macroscopical inspection, bears some resemblance to the ear of the sauria, but, as a matter of fact, is closer related to the mammalian ear.

Discussion: BERTHOLD, DENKER.

17. BÖNNINGHAUS (Breslau): **On the anatomy and physiology of the whale's ear.**

It is a phylogenetic fact that the ancestors of the whale were terrestrial mammals. Hence, it is interesting to investigate what changes the ear of the whale has undergone in the course of time by its adaptation to an aquatic existence. Bönninghaus has examined the ear of Phocæna communis on seven individuals (including one embryo).

18. BIEHL (Vienna): **On the origin and course of the vestibular nerve.**

Biehl selected sheep and horses as subjects for his investigations, because the nervus vestibularis in these animals is entirely separated from the n. cochlearis. Later Biehl confined his experiments to sheep, as the horses did not survive the operation long enough. Biehl exposed the occipital lobe and lifted it up; then the tentorium and the transverse sinus lay open for inspection. The hemorrhage was always quickly stopped by tamponing. Mechanical irritation of the vestibular nerve caused nystagmus and rolling movements. Then the nerve was divided. The animals, which always recovered quickly from the operation showed, pronounced disturbances of the equilibrium. On sections of the removed cerebrum Biehl traced the course of the nerve (Marchi's stain) from its origin to its exit.

19. DENNERT (Berlin): **Acoustic investigations on simultaneous tones and Helmholtz's theory on tone-sensation.**

In experimentally investigating the laws governing the transmission of sound from one sounding body to another, it must first be well understood that it makes a great difference whether the two bodies to be excited for sympathetic vibrations are equally (or nearly equally) tuned, thus having the same specific irritability, or whether such a relation is not present. Bodies of the same specific irritability excite one another to sympathetic vibration by comparatively small intensities of sound. Disregarding their physical qualities, their irritability, and the degree of damping,—conditions of importance for the phenomenon of co-vibration,—it is first necessary to distinguish whether the two bodies are in the same medium, or each in a different one, *e. g.*, one in air, the other in water. *Ceteris paribus,* bodies in the same medium are easily excited to co-vibration. If one body is suspended in air, the other in water, sympathetic vibration is more difficult. The influence of water on the vibration of bodies has to be determined; on this very different statements have been made. Dennert found that sympathetic vibration between sounding bodies in different media takes place when they are adequately tuned, *i. e.*, when both, influenced by their respective media, show the same number of vibrations. With tuning-forks thus adequately tuned, Dennert could demonstrate sympathetic vibration of the one in water excited by the one in air.

When the two forks were connected by a solid conductor, the experiments showed that no auxiliary apparatus was necessary to bring about co-vibration. It was important, however, to find a way of adjusting the experimental apparatus which would insure a better communication of sound from air to a fluid medium. Dennert's apparatus shows a striking analogy in principle as well as in its external arrangement to the mechanism of the middle ear. This fact, that acoustic experiments led to an arrangement analogous to the sound-conducting mechanism of the ear, while Helmholtz, inversely, deduced from the anatomical arrangements of the middle-ear apparatus its cardinal physiological importance, is an argument in favor of Helmholtz's hypothesis. The acoustic experiments have also demonstrated that an auxiliary apparatus is unnecessary to excite resonators in fluid media by solid conduction (analogous to bone-conduction), while such an apparatus is advantageous for the transmission of sound by air-conduction to fluid media and to resonators suspended therein.

Discussion. — KAYSER (Breslau): The salient point of the problem has not been completely solved by Dennert's experiments. Dennert transmits the vibrations of the fork in air to the one in water by direct contact. This would be analogous to the stapes being in direct contact with the membrana basilaris; both, however, are separated by fluid. The difficulty is in the transmission of vibrations from air to a fluid medium. We know that this involves a considerable diminution of sound, and the question is how, in spite of this diminution of sound, the ear is capable of such an extraordinary acuity of hearing. On the whole, Dennert's investigations have considerably advanced our knowledge.

SCHMIDT (Leipzig): Dennert's experiments are analogous to the conditions in the ear, as the transmission of vibration from the stapes to the basilar membrane is particularly direct.

ZIMMERMANN (Dresden): Since the experiments by Johannes Müller the chain of ossicles has been regarded physiologically as a columella. From recent investigations, however, it appears that the ossicles represent merely a damping apparatus.

PANSE (Dresden): The experiments referred to by Zimmermann should be accepted with reserve.

DENNERT admits that the problem is still far from being solved, but believes that his experiments have brought us a step nearer to its solution.

20. PANSE (Dresden): **On vertigo.**

Panse describes the nerve course through which we are informed as to our relations in space, and explains how illusions about these relations occur, and the sensation of vertigo.

Discussion: BERTHOLD (Königsberg) relates the case of a man who, when walking in the street, made a revolving motion after every third or fourth step, turning twice around his axis. The symptom was said to have appeared after an operation.

THOST (Hamburg): The phenomenon "vertigo" has been made a subject for discussion by the Congress of Physicians and Scientists of 1901, to be held in Hamburg.

21. BERTHOLD (Königsberg): **On the origin of entotic noises.** Berthold constantly hears a tone (c^3) in his left ear. Usually entotic tones are indications of a pathological condition of the ear. Until 1884 Berthold's ears did not trouble him; then after the development of a pharyngeal and tubal catarrh with autophony and impairment of hearing, noises appeared in the left ear. Aside from the high tinkling of f^3, which is not uncommon in healthy ears, Berthold heard a seething noise, and further, when shaking his head, a high, loud tone (c^3) as sounded from a bell, occurring with every jerking movement of the head, and instantly ceasing when the movement was stopped. If the auditory meatus is partially closed with the finger, small vibrations of the drum-membrane produced by the moving finger have no effect, but the tone (c^3) is heard as soon as the meatus is completely closed and the movements are made with the finger. The symptom appears also in walking and at night after hard work, then corresponding to the pulse-beat. Berthold thinks the tone is produced by certain parts in the ear being set in motion by shaking, and he suspects a relaxation of the joints between the

ossicles. The relaxation is probably only slight, otherwise a noise and not a simple tone could be expected. The tone becomes synchronous with the pulse when mental labor causes a hyperæmia of the head and ear.

Discussion: SCHMIDT (Leipzig) recommends for the suppression of a tone caused by hyperæmia the application of an ice-bag to the neck.

22. HABERMANN (Graz): **On the pathogenesis of deaf-mutism.** Habermann restricts himself, to save time, to the demonstration of his specimens. The first one is taken from a seventy-three-year-old deaf-mute. Left drum-membrane shows perforation and calcareous deposits, the right also residua of middle-ear suppuration. Ankylosis of the stapes by connective-tissue formations and hyperostosis of the bone; foramen rotundum is closed by osseous tissue. Head of malleus and incus are fixed to the lateral wall of the attic by connective tissue. The deafness in this case is due to the ankylosis of the stapes and the closure of the foramen rotundum, as far as a cerebral cause can be excluded (cerebrum was examined microscopically). In the second case the round window is closed by hyperostosis, while the foramen ovale is intact. In this case the deafness was not absolute.

23. SCHEIBE (Munich): **Ostitis of the labyrinth capsule.** In ostitis of the labyrinth capsule, which constitutes the principal pathological basis of sclerosis, there are, as Scheibe believes, with Politzer and Siebenmann, no material changes of the mucous membrane present, except in small isolated places over the ostitic foci. Habermann, however, thinks that in all these cases the mucous membrane was formerly inflamed, but had become normal again. One of the cases examined by Scheibe is that of a girl of twenty, with chronic suppuration, perforation of Shrapnell's membrane, and cholesteatoma. Three weeks previous to her death she became totally deaf in the diseased ear. At the post-mortem an intense inflammation was found in the cochlea and a fistula of the semicircular canal. The tympanum showed the signs of a chronic inflammation. Microscopical examination of the bone: Newly formed bone tissue at the horizontal semicircular canal and on the crura and foot-plate of the stapes. In the labyrinth capsule, just above the oval window, is an ostitic focus the size of a pin's head, protruding toward the tympanum. These foci consist of osteoid tissue; the surface of the newly

formed bone shows lacunar erosion; the cartilaginous layer at the foramen ovale has entirely disappeared. Apparently two different processes have been active simultaneously: first, a solidification of bone by the increase of the osseous tissue in the diploic interstices, and, secondly, an increase of the spongy tissue at the expense of the bone. The latter process has been named by Siebenmann, rarefaction (Spongiosierung) of the labyrinth capsule[1]; it takes place largely, as Siebenmann states, at the foramen ovale. Habermann found similar changes in chronic suppuration, and regards them as sequelæ of the middle-ear inflammation. In some of those cases where the deafness increases after the suppuration has subsided, the progressive diminution of hearing may be due to a "rarefaction," which can lead to an ankylosis of the stapes. Scheibe's second case was one of scarlatina-otitis, with residua of otitis interna. Here also a rarefaction of the labyrinth capsule was found. On the promontory, below the foramen ovale, was a focus with dilated medullary spaces. The ostitis was probably caused by the otitis interna. Scheibe's cases confirm the statement of Habermann that the same affection of the bone, as in sclerosis, can occur in chronic suppuration of the middle ear and perhaps in otitis interna.

Discussion: **HABERMANN** is pleased to have his investigations of ten years ago confirmed by Scheibe. He mentions a case (twenty-eight-year-old imbecile, who died from eclampsia) where he found the same changes as Scheibe. In his opinion the process in the bone (ostitis chronica) originates in an inflammation of the tympanic mucous membrane. The ostitic foci are nearly always located near the fenestræ; a rare location is that in the internal auditory canal. He has never found any isolated foci on the semicircular canals.

SCHEIBE does not believe that the ostitis in sclerosis is always caused by an inflammation of the mucous membrane. This is made improbable by the frequency of bilateral sclerosis, which exceeds the frequency of bilateral middle-ear inflammation, and further by the gradual progress of the ostitis in absence of inflammatory symptoms.

PANSE emphasizes the constitutional element in this condition. The rarefaction of the bone is similar to the changes in osteomalacia after parturition. Panse mentions the relationship between puerperium and sclerosis.

---

[1] See Siebenmann's excellent article with six beautiful plates on this subject, in these ARCHIVES, vol. xxix., p. 157, 1900.—ED.

HABERMANN insists that the origin of the disease is in the mucous membrane, which always shows histological changes even though the inflammation may not be recognizable by clinical symptoms.

24. GOERCKE (Breslau): **On caries of the ossicles.** The morbid anatomy of caries of the ossicles has been studied almost exclusively on specimens from operations. Such material, however, is too one-sided to throw sufficient light on the pathology of ossicular caries. The latter is usually too far progressed and the important initial stage is rarely observed. The development of the carious process can be studied more successfully on post-mortem specimens. Goercke has examined a large number of such ossicles. The specimens were first inspected in normal salt-solution with the stereo-microscope; they were photographed in the case of visible changes and then prepared for microscopic examination. Caries of the ossicles usually begins with a periostitis, but Goercke repeatedly saw specimens where in severe otitis media the medulla was primarily affected, the periosteum presenting no changes. While usually the inflammation spreads from the periosteum through the Haversian canals toward the medulla, occasionally a primary ostitis will occur and spread through the same channels toward the surface. Cases of caries which had healed spontaneously were comparatively numerous. The final result of the healing process varies considerably: it is either a shallow groove covered with a nearly normal mucous membrane, or the defect filled in with cicatricial tissue, or a new formation of bone has taken place from the periosteum (exostosis, hyperostosis). If the same process is active on the tympanic walls, it can come to an osseous fixation (adhesion) of the ossicles. The medullary foci also heal up spontaneously by the formation of cicatricial or osseous tissue, the latter resulting in a partial or total eburnation of the bone. Localization: the investigations confirmed the generally accepted opinion that the long process of the incus is most frequently affected, the hammer less frequently than the incus, the manubrium less frequently than the head of the malleus. But in several cases the very parts which are supposed to be rarely affected were found to be diseased exclusively, as the neck of the hammer, the articular surfaces, the body of the incus with intact processes. The otoscopic picture does not always give a reliable

intimation as to the location of the disease, although characteristic pictures, as tabulated by Leutert, may be relied upon in the majority of cases. The perforations at the upper pole which are supposed to indicate hammer- and incus-caries, were found by Goercke in cases with intact ossicles, and, on the other hand, cases with extensive carious changes in the ossicles showed perforations in the lower half of the membrane or even (one case) an intact membrane. One rule was shown to be consistent: wherever caries of the osseous walls of the tympanum was present, on the tegmen or on the lateral attic wall, or on the promontory or on the posterior wall of the meatus, it was invariably accompanied by caries of the ossicles.

Demonstration of microscopical sections, macroscopic specimens, and stereoscopic microphotographs.

Discussion: KRETSCHMANN asks whether the rarer localizations of caries were found coincident with tubercular changes.

EHRENFRIED thinks that the spontaneous recovery of caries justifies the use of the conservative treatment.

BIEHLE welcomes the investigations made by Goercke as very important and interesting, and mentions that he had been ordered by the military authorities to formulate practical rules for the estimation of such affections.

GOERCKE: In the cases of rare localizations of caries, the suspicion of tuberculosis was aroused several times and in a very few cases verified. Although the possibility of a spontaneous recovery may justify a trial with conservative treatment, too much reliance should not be placed on it in practice.

25. DEUTSCHLÄNDER (Breslau): **Demonstration of four patients with rhinoscleroma.**

26. HINSBERG (Breslau): **On the mode of infection in meningitis caused by suppuration of the frontal sinus.**

If in meningitis due to an empyema of the frontal sinus no carious defects are found in the bony partition between sinus and dura, the usual inference is that the infection followed the paths of the vasa perforantia. This mode of infection is illustrated by the report of the following case in Hinsberg's practice: A patient with a suppuration of nearly all the accessory cavities, of which both antra have been opened previously, complained of a severe frontal headache on the right side; irrigation per vias naturales was negative. Although there was no fever, no nausea, no slow pulse, nor any other alarming symptom, an operation on the right frontal sinus was performed to relieve the continuous and excruciating headache; the sinus was found to be divided by a septum and filled with pus. The carious orbital wall was removed; the cerebral wall appeared intact. During the night, patient became restless, and died in thirty-six hours.

Autopsy: Diffuse purulent meningitis, particularly of the right side. Dura over frontal sinus covered with a fibrinous layer, the bony partition thin, but free from macroscopic changes. Careful examination of the dura revealed a few very small nodules behind the sinus. Microscopic examination of bone showed the presence of numerous perforating vessels, and in several of them old, partly organized thrombi, in which no cocci could be found. The foci in the dura consisted of encapsuled conglomerations of round-cells with abundant cocci. The dura was considerably thickened over these places.

Discussion: HABERMANN mentions a case where, as shown at the post-mortem, an embolic brain-abscess of the right side had originated from perityphlitis; the abscess escaped into the right frontal sinus and thence into the left one, thus setting up an empyema of the left frontal sinus.

27. MANN (Dresden): **Mucocele of the right ethmoid cells.** A man thirty-nine years of age had an injury to his head when young, and acquired syphilis twenty years ago. About two years ago he noticed a protrusion of his right eyeball and a perceptible diminution of his vision on that side. At first the fundus of the eye was found normal, but soon an optic neuritis set in and the vision fell to $\frac{1}{4}$. Mann, in April, 1901, found the right eyeball very much protruding forward and outward, and a tumor the size of a cherry and of a tense elastic consistence in the inner canthus of the eye. Rhinoscopical examination and pushing aside the middle turbinal with Killian's speculum showed the floor of the ethmoid very much crowded downward and inward. The bone, which was covered with anæmic mucous membrane, was perforated with a probe and the opening enlarged with a Hartmann's forceps; a thick, chocolate-colored fluid was evacuated, which contained no bacteria, but abundant cholesterine crystals. There was no further discharge from the cyst. During the operation the bulb sank deep into the orbit, but was pushed back into its old abnormal position during the following days from blowing of the nose. The optic neuritis has disappeared and the eyesight has returned to the normal standard. The affection is rare, eight

cases in all having been reported. Mann emphasizes the necessity of a careful nasal examination in cases of orbital tumors.

28. WERTHEIM (Breslau): **Demonstration of a patient with bilateral empyema of the frontal sinus.**

Twenty-five-year-old man has had suppuration of accessory cavities since 1898. Left antrum and frontal sinus opened elsewhere Jan., 1898; five months later relapse and reopening of both cavities. The right frontal sinus had also been opened, but closed primarily, as no pus had been found. When patient came under Wertheim's care he complained of a severe headache on the right side, which disappeared after removal of an anterior hypertrophy of the right middle turbinal; there was no pus in the right nasal passages. December, 1900: Left frontal sinus opened, ethmoid cells found intact. March, 1901: Left frontal sinus nearly dry. After influenza in March, renewed acute inflammation of the right frontal and maxillary sinuses. Antrum opened, mucous membrane found diseased. At the end of April: Right ethmoid cells and right sphenoid sinus opened through the nose. The symptoms disappeared. At present the left frontal sinus is obliterated with the exception of its ostium; the right sinus shows a very scant mucous secretion. An attempt will be made to shut off the frontal sinuses from the nose to prevent their reinfection.

29. EHRENFRIED (Berlin): **On the conservative and operative treatment of suppuration in the middle ear.**

Ehrenfried in his paper makes an ardent plea for the "conservative treatment" of purulent otitis media. His method consists principally in cleansing of the ear and instillation of a lysol solution, then using suction by means of a rubber bag, and repeating the whole procedure until no more pus appears.

Discussion: PREYSING: The paper is open to criticism on several points. It is to be regretted that the speaker has no knowledge of or fails to realize the brilliant results of the surgical treatment of middle-ear suppurations.

Availing themselves of the invitation of Councilman Dr. Steuer, the members of the society, on Saturday, before the morning session, visited the Department for Ear, Nose, and Throat Diseases in the All-Saints' Hospital.

This department, founded ten years ago by a legacy bequeathed by Dr. Jacoby, has been considerably enlarged since. The wards on the second floor contain four large rooms and one single room, accommodating altogether fifty patients; on the second floor there are two rooms for nurses, the kitchen, and a bathroom with sweat-bed. On the ground floor are the polyclinic rooms, consisting of a waiting-room, large dispensing-room, and two dark rooms; the operating-room, an inhalatorium with four places, a special room for internal and acoustic examinations; the office of the chief-surgeon and the laboratory. The latter consists of two rooms, the microscopical room with three working places for histological and two for anatomical work, and a second room for the use of the microtome and for bacteriological investigations. The institution was greatly admired by the visitors, particularly the equipment of the clinical dispensing-room and of the clinical (5) working-places.

Brieger on this occasion demonstrated a number of interesting cases: a cerebellar abscess cured by operation (due to purulent otitis media following shotgun injury), several cases of sinus thrombosis, a case of leucæmic deafness, a case of traumatic atresia removed by operation, etc.

In connection with the sessions an exhibition of specimens, models, instruments, etc., was held in the adjoining rooms. Owing to the efforts of the executive committee and the large interest taken in the exhibition, the latter was so well arranged and extensive that it is impossible to describe or even to enumerate in this brief report the abundance of interesting exhibits. A complete catalogue will be added to the official report of the transactions. A few of the objects may here be mentioned to illustrate the scope and character of the exhibition:

Specimens and models of the human ear and its parts for teaching were numerous and manifold. Conspicuous were the beautiful preparations by Tramond of Paris, exhibited by the Anatomical Institute in Breslau. Models of the ear from papier-maché after Frohse were exhibited by the firm of Benninghoven and Sommer (Berlin). Other specimens for demonstrative purposes (normal and pathological): by Berliner (Berlin), plaster of Paris models and colored wax-casts of the ear; by Brühl (Berlin), sections of the skull, made transparent to demonstrate the topography of the nose and its accessory cavities; similar preparations by Katz (Berlin), with stereoscopic slides; by the Royal Polyclinic for Throat, Nose, and Ear patients in Breslau (Kümmel), numerous corrosion specimens after Siebenmann, Semper-

Riehm's dry-preparations; by the All-Saints' Hospital in Breslau (Brieger), dry specimens illustrating the development of the organ of hearing, specimens mounted in Kaiserling's fluid representing normal and pathological conditions of the middle ear, and preparations showing the possible injuries in ear operations, etc.

Pathological specimens (macro- and micro-scopical) were abundant: *e.g.*, by Biehl (Vienna), sinus thrombosis; by the Clinic in Rostock (Körner), ossicles mounted between watch crystals; by the Clinic in Breslau, collections of foreign bodies, cholesteatomata, etc.; by the All-Saints' Hospital in Breslau, dehiscences in the different parts of the temporal bone; by Panse (Dresden), suppuration of the labyrinth, etc. Drawings, pictures, radiograms, diapositives, etc., were exhibited: by Hartmann (Berlin), nasal accessory cavities; Habermann (Graz), ostitis of the petrous bone; Scheibe (Munich), anchylosis of the stapes; All-Saints' Hospital (Breslau), caries of the petrous bone; numerous diapositives by the Optical Institute, Krüss (Hamburg).

Comparative anatomical specimens were presented by: Biehl (Vienna), petrous bone of sheep; Bönninghaus (Breslau), the ear of whales; Denker (Hagen), corrosion-preparations of the ear of several vertebrates. Bacteriological exhibits: by the All-Saints' Hospital in Breslau, cultures of all pathogenic germs met with in the ear. Apparatus, instruments, etc., were exhibited by physicians as well as by institutions, commercial firms, and engineers. Among others that were of interest were the following: by Keyser (Breslau), a physical apparatus for investigations on the vibration of sound in fluid media; by the All-Saints' Hospital (Breslau), an ear microscope, constructed by Zeiss in Jena; by the firm of Tiessen (Breslau), an electromotor with speed transformer for tympanum and larynx massage, and with air pump for inhaling purposes; also, equipments of bacteriological and histological working-places (principally models from the All-Saints' Hospital); by the firm of G. Haertel (Breslau), numerous instruments in use at the Royal Polyclinic and at the All-Saints' Hospital, as: a laryngeal forceps after Kümmel; an operating-table after Braatz; an apparatus with filter-syringe after Brieger for sterile irrigations of the ear. The Medical Warehouse (Berlin) exhibited beautifully made specimens and numerous new instruments; also a new examining- and operating-chair after Hartmann. The renowned firms, Detert (Berlin), Pfau (Berlin), and Katsch (Munich), were well represented.

REPORT OF THE SECTION ON OTOLOGY OF THE NEW YORK ACADEMY OF MEDICINE.[1]

STATED MEETING, MAY 8, 1901.

JAS. F. MCKERNON, M.D., in the Chair.

R. C. MYLES, M.D., Secretary.

Presentation of a case of **rodent ulcer of the ear.**

Dr. WOLFF FREUDENTHAL: This patient, whom I have the honor of presenting to the Section, was sent to me from the West Indies. He is forty-five years old and has been sick about six years. His disease commenced as a rodent ulcer, or epithelioma of the skin, below the ear. It progressed and affected the ear, and his attending physician, Dr. Lens, treated it with different astringents. The remedy that produced the best results was arsenic applied locally. The disease did not make any advance, so the doctor was satisfied with the use of astringents. Later on a new eruption appeared and the patient went to different physicians for treatment, all of whom advised a radical operation. Dr. Lens opposed it. In June of last year this operation was performed. As you may see, about two thirds of the ear and a good deal of the skin of the face were removed. Before the operation the hearing was good, but afterwards it diminished materially. The canal, which formerly was of normal size, is now very much smaller on account of the cicatrization. Right after the operation was done, the ear commenced to run, and it ran freely although the physician cauterized it frequently with the galvanocautery. When I first saw the patient, it ran very much and there was a bad odor with it. The mastoid was free. I could not make an inspection of the inner ear because I could not see anything on account of the narrowness of the canal. The probe entered one and a half inches into the ear and I noticed bare bone towards the front. I am particularly interested in the treatment of this case. Among the different things that I have used experimentally for his relief so far is *electric light.* If the rays of electric light do what is claimed by so many, *i. e.*, if they are capable of killing bacilli, I thought this would be a good case for their application. We all know very well that the rays of electric light will destroy even tubercle bacilli, and I thought I ought to get some good effect from its application in this instance. I must say that the discharge has diminished very much so that now the patient does not require the use of cotton in his ear. The patient here is particularly interested in the question as to whether this might not develop into malignant disease. I would like the opinion of any of the gentlemen present. The discharge from the ear has not been examined as yet by me, but Dr. Lens did it. No tubercle bacilli were found. The glands were never swollen and there are no signs whatever of syphilis, nor of lepra.

---

[1] E. Franklin Smith, M.D., Stenographic Reporter.

Dr. ROBERT C. MYLES; I think it was a year or so ago that I presented to the Section a case of epithelioma similar to the one presented to-night. The specimens consisted of the cochlea, the promontory and part of the semicircular canals, which I removed. They were presented in a bottle. The epithelioma was removed and the disease never returned. The patient was in my office three days ago and appeared to be perfectly well, although he did not hear on that side. There was no discharge. No external incision had been made but the specimens were removed by cutting the canal open and dilating it; trephines and drills were used. A very bad prognosis was given, but the patient is now entirely well. In this case I advised opening up the canal and removing all the dead bone.

Presentation of a case of **mastoid fistula.**

Dr. THOMAS J. HARRIS: This case is a simple one yet I thought that possibly it might prove of interest to members of the Section. The patient is a woman of about twenty years, who was operated upon a year ago last March, an ordinary mastoid operation being done. She was in the hospital about eight weeks and was then discharged as cured. I think she kept on coming to the morning clinic to see the house surgeon for a period of two months after, when she dropped out of observation until the early part of last winter when she came to us complaining of much noise in the ear. An examination of the mastoid wound showed

a fistula in the extreme upper opening. This has persisted for two months. A probe introduced enters the attic. There is very little discharge, at times none. The drum membrane has entirely healed up.

I suppose the gentlemen of the Section have had many such cases, but I thought they might be interested and wish to look at it. The tube is quite patulous. The incus is in situ. I am in doubt as to whether I am justified in cutting down upon it without further symptoms being present.

Dr. HERMAN KNAPP, on being asked, said: I have had more experience in these cases than I liked. They may last for years, sometimes they will close, and later present themselves with an abscess formation, which, when opened, will heal up quickly and permanently. Probably the majority of them require only ordinary dressing and curettement to cicatrize smoothly and permanently. Other cases again will be covered with apparently healthy cicatricial tissue, but secretion will burrow underneath it and downward, forming a new crater, which will lead the probe to more deep-seated bare bone, necessitating scraping away the hard granulations between the two fistulas and resuming the treatment until, with a good deal of patience, a permanent, healthy cicatrization is brought about.

Presentation of a case of **brain abscess; operation, recovery.**

Dr. JAMES F. MCKERNON: This is a case of temporo-sphenoidal abscess which was operated upon February 8th. I saw the case on the 7th of February, and the symptoms present at that time were a very marked purulent discharge from the external auditory meatus, partial coma, temperature 97° F., pulse 54, respiration 16. The eyes were not examined, there being no facilities for an examination at that time. Upon removing the pus from the external auditory meatus, nothing could be seen in the deeper part at all except prolapsus of the superior and posterior wall, which came in contact with the lower wall. It was learned that the discharge had existed over a period of thirteen years.

The probable diagnosis was made of brain abscess. No effort at location was attempted. Operation was advised and performed the following day. Previous to the operation a probe was passed into the external auditory meatus, and encountered exposed bone over the inner tympanic wall; this was verified later, when it

could be seen where the destruction had taken place. Previous to the operation the discharge from the external auditory meatus was examined by the pathologist, Dr. Dixon, who reported that there were present a large number of streptococci, also some diplococci and staphylococci. The ordinary mastoid operation was performed. The mastoid was found to be as hard as ivory. Practically there was no mastoid antrum, its place being taken by hard bony tissue. Feeling sure that there was a collection of pus in the cerebrum, the incision was extended forward over the temple and the flap drawn upward. I found here softened bone directly over the roof of the tympanum extending upwards about 1½ inches. A large collection of epidural pus was found beneath this bone. After its removal the dura bulged unusually into the wound. It was incised sufficiently to admit a grooved director, which passed inwards and upwards for about two inches. When it was withdrawn there followed no pus. The incision was then enlarged and the index finger introduced between two and three inches along the director when it came in contact with soft tissue and, upon its withdrawal, a discharge of pus followed. About four or five drachms of pus were evacuated, together with broken-down brain tissue. The cavity was irrigated with a hot saline solution and the patient taken back to bed, and no unpleasant symptoms followed for forty-eight hours. After irrigation, this cavity was packed, according to the method of Macewen, with gauze rolled in equal parts of iodoform and boric acid. The morning following the operation the pulse had increased from 54 to 82 or 86, and the respiration was normal. Previous to the operation the patient had complained somewhat of dimness of vision on that side, and light pains on both sides. The attending physician told me that aphasia was present. Forty-eight hours after the operation there was a slight rise in temperature (100.5 °) with a correspondingly increased pulse rate. The dressings were removed, and a small amount of pus was found with quite a little serous discharge. The wound was again packed in the same manner as before with gauze rolled in a powder of equal parts of iodoform and boric acid, and this was left in for four days. The temperature dropped to 99°, and the pulse ranged from 75 to 86. This was six days after the operation. Owing to a suggestion made in this Section some weeks previous, I determined to try drainage by the use of tubes. The cavity was irrigated with the hot saline solution and a moderately

a f
two
litt
hea
I
cas
it.
dou
out
D
exp
som
abs
pern
nary
nent.
cicat
down
more
gran
until.
zatio
Pr
ery.
D
dal
case
time
aud
resp
fac
pus
the
rio
lea
ye

at
the
in
o

there were no evidences of inflammation of the external ear. I would like to go briefly into her history with the hope of obtaining some indications for treatment from the members present.

This patient, about a year and a half ago, was attacked by influenza with acute purulent otitis in both ears. She was in bed about one month. She had an abscess not only in the ears, but also in the foot as well. I treated her for a few months and she made a good recovery. About nine months later she had a relapse with discharge from both ears. Her condition became worse with her general health much impaired. She lost weight steadily. Her bowels were constipated. She was unable to eat on account of increased nausea and she vomited almost everything she ate. Her pulse became slow, very weak and irregular, and her temperature subnormal. She had increasing attacks of pain in the ears, and after six months of treatment without benefit, I operated upon both ears. At the time of operation the pulse was about 30, and very weak and irregular. The temperature was below normal, and she had constant attacks of nausea and vomiting. I first operated upon the right ear. The pulse rose from 30 to 60. I then operated upon the left ear, and, while still under the influence of the ether, the pulse became stronger. I took away bone from the posterior and upper wall of the external auditory canal, opening up the parts freely, but I did not find any large amount of pus. Before the operation, the cartilage of the external ear had given her no trouble whatever. But, the next day, the external canal of both ears was completely stopped up, and she had a most agonizing pain which has continued pretty much ever since. The external canal of the right ear, at the end of about one month after the operation, became quite open, but that of the left ear has remained completely closed, so that I have been unable to introduce even the smallest probe into it.

I should like to have some of the members present look at her and make an examination of the ear and make some suggestions as to the treatment of the case. The slightest pressure cannot be borne by her. She has had attacks of swelling over the mastoid and its neighborhood, which have somewhat subsided, but there still remains some swelling over the bone. Since the operation, her general health has improved very much, and she has gained considerably in weight. But she still has a catarrhal inflammation of the stomach and bowels and some attacks of nausea. At the time of the operation I used some iodoform.

Dr. THOMAS J. HARRIS: What was the condition of the middle ear before the operation, and how much destruction of tissue was found in the mastoid cells?

Dr. BATES: The mastoid cells were swollen and the bone was sclerosed, much more so on the right than on the left side; the bone was like ivory. I had a bacteriological examination made, and the pathologist reported the presence of staphylococci. The middle ear was nearly normal.

It seems to me that this is a case of perichondritis of the auricles, and that it is complicated by a uric acid or a similar diathesis. I have seen several such cases caused primarily by injury which have failed to respond to treatment until the uric-acid condition of the patients had been corrected. I recall one case particularly, in which there was a gastro-intestinal catarrh, accompanied at intervals by a "gastric crisis." At the time of the "crisis" the auricles became red and swollen and took on an appearance similar to this case. In two other cases also of injury followed by perichondritis there were rheumatic affections of the joints, and the auricles failed to yield to local treatment until the joints became well under treatment.

Dr. THOMAS J. HARRIS: I agree with the statements made by Dr. Bates, but I think that, in addition to the uric-acid diathesis being an exciting cause, any operation upon the mastoid should also be considered an exciting factor. In the case just presented, I think the traumatism caused by the removal of the posterior wall, etc., is sufficient to act as an exciting cause.

In the cases that I have had I have noted a decided improvement by the use of varying sizes of drainage tubes. I remember one case of total occlusion of the canal, which was opened up by the use of the rubber drainage tube. If the Doctor has not tried this I would urge him to attempt this procedure.

Dr. EDWIN W. PYLE: So far as stenosis is concerned, I have had one or two cases in Dr. Whiting's clinic in which hot-water irrigations were used from a height, with a pressure from three to six feet, with excellent results. The good results came simply from the contracting influence of heat applied in this manner.

This mode of treatment is applicable to stenosed conditions arising from inflammatory action and not from cicatricial contraction. The latter will yield only to operative measures.

Dr. BATES (closing the discussion): I am glad to hear what has been said about the uric-acid diathesis, because it applies so well to the condition of this patient. She has uric-acid diathesis as badly as people get it. The urine at times has a specific gravity of 1.050, and only by the ingestion of large quantities of water and alkalies can this patient be made at all comfortable.

In regard to the operation itself being an exciting cause of this condition, I do not understand how that could be. I have done this operation more than twenty or thirty times, and I have never seen it occur before. This patient was operated upon six months ago, and the inflammation of the auricle is worse now than it ever has been. Not only did she have inflammation of the auricle, but it extended down the neck and in front of the ear.

Dr. Harris has referred to the use of tubes. We used tubes in this case, and they worked well in the right, but not in the left ear. I introduced quite a large-sized tube after the operation, but now I cannot get the smallest-sized probe into the left ear at all.

In regard to the use of hot water for syringing, the patient used large quantities of it (gallons during four months) to relieve the agonizing pain. I do not know when I have had a case where the treatment gave me so much concern as has this one.

REPORT ON THE PROGRESS IN OTOLOGY DURING THE FOURTH QUARTER OF THE YEAR 1900.

BY DR. A. HARTMANN.

Translated by Dr. ARNOLD KNAPP.

PHYSIOLOGY OF THE EAR.

284. **Adler.** On Flourens's experiment with the semicircular canals. *Monatschr. f. Psychiatrie*, Dec., 1900.

285. **Adler.** The vestibular reflex ; the relations of the cerebellum to this and to the reflex tonus. *Ibid.*

286. **Dreyfuss.** Experimental study on the non-acoustic function of the ear labyrinth. *Pflüger's Archiv f. d. ges. Phys.*, vol. lxxxi., 1900.

287. **v. Stein.** A new independent apparatus to regulate automatically the ocular movements. *Centralbl. f. Physiolog.*, Aug. 4, 1900.

284. ADLER gives his views on the apparent movements which set in on irritation or cessation of action of each circular canal, and agrees with Ewald's theory. If the right external canal is divided, as the activity of the tonus labyrinth is constant, the right is arrested and the left receives increased stimulation, an apparent movement results, the head is turned to the left, which is followed by a reactive reflex head movement to the right. If the two posterior are divided, the two anterior preponderate, and the head turns back again ; if the anterior are divided, the head falls forward. DREYFUSS.

285. ADLER endeavors to explain the relations between the cerebellum and the vestibular apparatus and to the reflex tonus.

DREYFUSS.

286. This is a supplementary study to Ewald's well-known investigations. After describing the symptoms of the rotatory vertigo in the normal animal (guinea-pig), experiments on animals

with one-sided or two-sided loss of labyrinth are carefully detailed. Two phenomena are especially striking—the relaxation of the entire voluntary muscular apparatus and the absence of rotatory vertigo,—both of which can be explained by loss of tonus. The marked vertigo following one- or both-sided removal of the labyrinth can be easily explained by the theory of the tonus labyrinth. The terminations of the vestibular nerve in the acoustic hairs are the organs of static sense which inform us of rotatory movements and, in general, of our position in space. This results from the vestibular terminals transmitting a permanent tonus to all the striated body muscles. A number of clinical cases are added to show the absence of muscular tone and the unfavorable influence exerted by the loss of the tonus labyrinth in certain deaf-mutes on the muscles of speech and voice. Disturbances of co-ordination in the tabetic may be partly due to an atrophy of the vestibular nerve. DREYFUSS.

287. v. STEIN has made a number of experiments on healthy persons and on those with ear disease, in rotation on the turning disc, which confirm in general well-known phenomena of rotatory vertigo. According to the reviewer, however, he has not succeeded in establishing a new independent apparatus which regulates automatically the ocular movements. DREYFUSS.

GENERAL.

a.—REPORTS AND GENERAL COMMUNICATIONS.

288. **Haug** and **Laubinger.** Report of the University Ear Clinic in Munich for 1899. *Arch. f. Ohrenhlk.*, vol. l., p. 182.

289. **Reik, H. O.** Report on the examination of the ears of 400 school children. *Bulletin of the Johns Hopkins Hospital*, Dec., 1900.

288. 2917 patients were treated; 12 radical and 21 Schwartze operations were performed. BRÜHL.

289. A deficiency of hearing was detected in 45, or 10%. This was relieved in 13 by removing the accumulated cerumen. The remaining 32 showed the results of former ear disease or present abnormal conditions in the ear, nose, and throat, which would require treatment at the hands of an aurist. The upper tone-limit was examined in those able to give reliable answers and found to be somewhat higher than is usually given, and averaged 0.6 on the Galton whistle. The report closes with some interesting observations on the study of the auricle and its peculiarities; the abnormalities are given in a table. ARNOLD KNAPP.

b.—GENERAL SYMPTOMATOLOGY AND PATHOLOGY.

290. **Rhese.** Sympathetic ear disease. *Deutsche medic. Wochenschr.*, No. 46, 1900.

291. **Sendriak.** Sypilitic primary lesion in the mouth, pharynx, nose, and ear. *Monatschr. f. Ohrenhlk.*, No. 11, 1900.

292. **Cozzolino.** A case of pseudo-actinomycosis of the external ear, produced by a new thread bacterium. *Arch. f. Ohrenhlk.*, vol. l., 1900.

293. **Burnett, Charles H.** Chronic ear-vertigo (Ménière's disease); its mechanism and surgical treatment. *Philadelphia Medical Journal*, Sept. 22, 1900.

290. RHESE reports three cases where removal of the hammer adherent to the labyrinth wall produced an improvement in the hearing of both ears. In two of these cases the chain of ossicles on the non-operated ear was not interrupted. Rhese believes that here the extraction of the hammer destroyed the synergic action of the tensor tympani in the other ear and caused the improved hearing and arrest of subjective noises. In the third case, however, the ossicular chain was interrupted and Rhese thinks that as both acoustic nerves anastomose with one another, inhibitory stimuli are transmitted through the tympanic plexus to the sound-perceiving part of the other ear. NOLTENIUS.

291. SENDRIAK collected 118 cases of primary lesion in the nose. The external site was usually on the alæ, internally on the septum, from an infected finger. In the naso-pharynx, the chancre occurred 88 times, nearly always the result of catheterization; 71 of these were described in French literature. This affection has only been reported 28 times on the external ear and twice in the canal. KILLIAN.

292. This patient, described in volume xlvi. of the *Arch. f. Ohrenhlk.*, was taken ill, after two months of apparent health, with swelling of the neck, and died from meningitis. The autopsy showed extension of the purulent process along the lower plane of the temporal bone, thrombo-phlebitis of the venous carotid plexus and lateral sinus. Cultures of the blood showed the same resisting bacterium as the periauricular foci. BRÜHL.

293. Chronic ear vertigo, or Ménière's disease, is considered by BURNETT to be due to a mechanical cause, consisting chiefly in impaction of the stapes in the oval window. The object of the operation is to remove the retractive force producing the pressure, and thereby liberate the stapes, which will cure the disease. This is accomplished by a removal of the incus, which breaks the re-

tractive force of the tensor tympani and malleus exerted through it upon the stapes, and the latter bonelet is thereby relieved. While the production of ear vertigo in purulent cases is somewhat different from that seen in chronic catarrhal otitis, Burnett thinks that its mechanism is the same. In addition to removing the incus, it is necessary to excise the remnants of the diseased drum, the malleus, and whatever synechiæ are present before the stapes is freely liberated. In all, the operation has been performed twenty-seven (27) times for aural vertigo, mostly in chronic catarrhal otitides, and in no instance has it failed to give relief. No serious reaction has ever been encountered in either class after the operation. J. B. CLEMENS.

c.—METHODS OF EXAMINATION AND TREATMENT.

294. **Lucae.** On bone-conduction. *Arch. f. Ohrenhlk.*, vol. l., p. 187.

295. **Gellé, Georges.** Bone-conduction in nervous patients. *Arch. Internat. de laryng., d'otol.*, etc., vol. xiii., No. 5.

296. **Stenger.** Objective determination of one-sided deafness with tuning-forks. *Arch. f. Ohrenhlk.*, vol. l., p. 197.

297. **Jürgens.** On the value of percussion in the diagnosis of mastoid disease. *Monatschr. f. Ohrenhlk.*, No. 11, 1900.

298. **v. Stein.** Phenosalyl in laryngeal tuberculosis and in diseases of the nose and ear. *Klin. therap. Wochenschr.*, No 43, 1900.

299. **Lockard, Lorenzo B.**, Pasadena, Cal. The Eustachian bougie. *N. Y. Med. Jour.*, Dec. 29, 1900.

295. GELLÉ tested the hearing duration for tuning-fork a′ in neurotic individuals with unaffected hearing, and compared it to the normal. In all, the duration was found shortened, and in the neurasthenics and hysterical the hearing duration became less on successive examination, while the opposite obtained in the melancholiacs and paranoiacs. Gellé believes the diminished durations to be due in all cases to inattention, associated with the psychic or nervous troubles. SCHWENDT.

296. If two equally vibrating forks be held at different distances from both healthy ears, the nearest fork alone will be perceived. If an ear is supposed to be deaf, a fork c′ is held 5 *cm* from this ear, another fork is approached to the healthy ear; if the former be deaf, the latter will hear the fork at a greater distance, or *vice versa.* BRÜHL.

297. JÜRGENS, after accurate tests, concludes that percussion of the mastoid has no diagnostic value. KILLIAN.

298. v. STEIN uses a 5 % phenosalyl solution in glycerine in

a fistula in the extreme upper opening. This has persisted for two months. A probe introduced enters the attic. There is very little discharge, at times none. The drum membrane has entirely healed up.

I suppose the gentlemen of the Section have had many such cases, but I thought they might be interested and wish to look at it. The tube is quite patulous. The incus is in situ. I am in doubt as to whether I am justified in cutting down upon it without further symptoms being present.

Dr. HERMAN KNAPP, on being asked, said: I have had more experience in these cases than I liked. They may last for years, sometimes they will close, and later present themselves with an abscess formation, which, when opened, will heal up quickly and permanently. Probably the majority of them require only ordinary dressing and curettement to cicatrize smoothly and permanently. Other cases again will be covered with apparently healthy cicatricial tissue, but secretion will burrow underneath it and downward, forming a new crater, which will lead the probe to more deep-seated bare bone, necessitating scraping away the hard granulations between the two fistulas and resuming the treatment until, with a good deal of patience, a permanent, healthy cicatrization is brought about.

Presentation of a case of **brain abscess; operation, recovery.**

Dr. JAMES F. McKERNON: This is a case of temporo-sphenoidal abscess which was operated upon February 8th. I saw the case on the 7th of February, and the symptoms present at that time were a very marked purulent discharge from the external auditory meatus, partial coma, temperature 97° F., pulse 54, respiration 16. The eyes were not examined, there being no facilities for an examination at that time. Upon removing the pus from the external auditory meatus, nothing could be seen in the deeper part at all except prolapsus of the superior and posterior wall, which came in contact with the lower wall. It was learned that the discharge had existed over a period of thirteen years.

The probable diagnosis was made of brain abscess. No effort at location was attempted. Operation was advised and performed the following day. Previous to the operation a probe was passed into the external auditory meatus, and encountered exposed bone over the inner tympanic wall; this was verified later, when it

could be seen where the destruction had taken place. Previous to the operation the discharge from the external auditory meatus was examined by the pathologist, Dr. Dixon, who reported that there were present a large number of streptococci, also some diplococci and staphylococci. The ordinary mastoid operation was performed. The mastoid was found to be as hard as ivory. Practically there was no mastoid antrum, its place being taken by hard bony tissue. Feeling sure that there was a collection of pus in the cerebrum, the incision was extended forward over the temple and the flap drawn upward. I found here softened bone directly over the roof of the tympanum extending upwards about 1½ inches. A large collection of epidural pus was found beneath this bone. After its removal the dura bulged unusually into the wound. It was incised sufficiently to admit a grooved director, which passed inwards and upwards for about two inches. When it was withdrawn there followed no pus. The incision was then enlarged and the index finger introduced between two and three inches along the director when it came in contact with soft tissue and, upon its withdrawal, a discharge of pus followed. About four or five drachms of pus were evacuated, together with broken-down brain tissue. The cavity was irrigated with a hot saline solution and the patient taken back to bed, and no unpleasant symptoms followed for forty-eight hours. After irrigation, this cavity was packed, according to the method of Macewen, with gauze rolled in equal parts of iodoform and boric acid. The morning following the operation the pulse had increased from 54 to 82 or 86, and the respiration was normal. Previous to the operation the patient had complained somewhat of dimness of vision on that side, and light pains on both sides. The attending physician told me that aphasia was present. Forty-eight hours after the operation there was a slight rise in temperature (100.5 °) with a correspondingly increased pulse rate. The dressings were removed, and a small amount of pus was found with quite a little serous discharge. The wound was again packed in the same manner as before with gauze rolled in a powder of equal parts of iodoform and boric acid, and this was left in for four days. The temperature dropped to 99°, and the pulse ranged from 75 to 86. This was six days after the operation. Owing to a suggestion made in this Section some weeks previous, I determined to try drainage by the use of tubes. The cavity was irrigated with the hot saline solution and a moderately

307. Both ruptures occupied the lower part of the drum, one in the anterior, the other in the posterior quadrant, 3–4 *mm* apart; no trace remained after two weeks and the hearing was perfect.
POLLAK.

308. ROBERTS calls attention to the great improvement possible in many auricular deformities, by using strict modern antiseptic surgical methods. Roberts thinks it is the more worthy of attention as the operative treatment is free from risks and, usually, unaccompanied by confinement to bed or even absence from business pursuits. A lacerated auricle should be subjected to thorough sterilization and carefully sutured. After the removal of tumors or the occurrence of sloughing from burns, frost-bite, or injury, in order to restore symmetry of the two ears much artistic skill is required, as it may be necessary to operate on the uninjured ear to make it correspond with its fellow. Lost tissue may be supplied from the neck or cheek, or transplanted from the hand, abdominal wall, or thigh. Some deformities or distortions may be corrected by orthopædic means, and, to give rigidity to flaccid parts, imbedding of plates of platinum has been suggested. Fistulæ may be closed by dissecting out the tubular tract and closing the resulting wound. J. B. CLEMENS.

HATCH (309) collected and carefully examined all cases treated at the Jamsetjee Jeejeebhoy Hospital in Bombay during the rainy month of October.

The diagnosis of fungus was verified in each case by microscopical examination.

The symptoms varied from slight to considerable deafness attended by pain which was occasionally severe.

The cases may be divided clinically into dry and moist forms. In the latter, the symptoms of eczema were present to a greater or less extent and there was always a watery or slightly purulent discharge. In the majority, the aspergillus niger was found; there being a quantity of moist-looking epithelium on which black particles were plainly visible, having the appearance of grains of gunpowder. If the particles were plentiful, there was more black than white visible. After syringing and clearing, the walls were red, often denuded of epithelium, and irregular with small furuncles and swellings, and the membrane either bright red in color or dull and sodden-looking. Often the aspergillus flavus could be seen growing on the surface of the small superficial pustules, and if in any quantity the small balls of sporangia were plainly visible.

The growth of penicillium glaucum gives a fluffy appearance to the surface. In the dry variety, the symptoms of pain, uneasiness, and deafness were also complained of, but there was no discharge. The canal was sometimes blocked with epithelial débris with yellow, black, or brownish-looking particles on the surface; in other cases the walls of the canal were coated with a crust, usually of a darkish color, on which the fungus could be seen growing, the appearance not being unlike that of rhinitis when dry crusts coat the surface of the mucous membrane. The membrane was then visible and the surface was generally partially coated with the same fungus. Sometimes white patches on the membrane were met with and were difficult of removal. After syringing, the walls of the canal were red but dry and the membrane was not so often inflamed as in the moist variety. Sometimes the amount of spores was largely in excess of the mycelium.

The treatment consisted in syringing very thoroughly and using iodoform and boracic acid in equal parts, cleanliness and dryness being most important factors. A summary of cases is given. Interesting descriptions of the varieties of fungi found are given by Row.

Hatch has administered subcutaneously some of the fungi to rabbits and monkeys; the lesions were, invariably, localized abscesses at the seat of inoculation, containing pultaceous, almost doughy, pus, which contained the mycelium as well as conidia.

The abscesses were, as a rule, well encapsuled, admitting of easy dissection. In one case where only mycelium was inoculated, the abscess contents were more fluid and mixed with blood.

The paper is an important contribution to the subject and should be noted. ARTHUR CHEATLE.

MIDDLE EAR.

a.—ACUTE OTITIS MEDIA.

310. **Heine.** The particular danger of acute purulent otitis in advanced age. *Berl. klin. Wochenschr.*, No. 35, 1900.

311. **Weiss, Siegfried.** Prophylaxis of otitis in measles. *Wien med. Wochenschr.*, No. 52, 1900.

312. **Katz, L.** On excrescences of the drum membrane in acute purulent otitis; their treatment and histology. *Arch. f. Ohrenhlk.*, vol. 50, p. 211.

313. **Tomka,** Budapest. A case of acute purulent otitis in morbus maculosis Werlhofii. *Arch. f. Ohrenhlk.*, vol. 50, p. 207.

314. **Coulter, J. Homer.** Ear diseases in infancy and childhood. *Journ. Am. Med. Assoc.*, Dec. 15, 1900.

315. **Chambers, T. R.** Bacteriologic examination of purulent otitis media and suppurative mastoiditis. *Journ. Am. Med. Assoc.*, Dec. 29, 1900.

316. **Francis, Alexander.** Notes on a case of emphysematous otitis due to the bacillus aërogenes capsulatus. *Australasian Med. Gazette*, Oct. 20, 1900.

HEINE (310) reports four cases, and claims that acute purulent otitis in persons over forty years, even when properly treated, is an unusually dangerous illness owing to the insidious course and absence of symptoms of mastoid involvement demanding early intervention. The cause is explained by sclerosis of the bone and certain anatomical peculiarities (slight cellular development in the mastoid, spongiosa formation of the labyrinth). The mastoid should be opened in older people on the appearance of the swelling or infiltration of the mastoid integument, slightly prolonged tenderness, slight sinking of the wall of the canal, finally in violent headache even if the discharge from the middle-ear be free. MÜLLER.

WEISS (311) recommends, as a prophylactic measure, correcting the occlusion of the nose on the ground that retention of mucus in nose and naso-pharynx causes the otitis. Treatment consists in the introduction of one per cent. yellow oxide of mercury ointment on a cotton applicator into the lower meatus, or the instillation of a one half per cent. silver nitrate solution. After one treatment the frequency of the otitis sank from 27.7 % to 18.7 %, and after four times daily treatment only 6.7 % of those affected with measles acquired otitis. HARTMANN.

312. The author has overlooked Bezold's and Grünwald's articles on this subject, and regards the perforating polyp as an excrescence of the epidermis or cuticular layer of the drum, while in Bezold's opinion, with which the reviewer also joins, the protrusion is formed by hypertrophic mucous membrane of the inner surface of the drum. The latter, according to Grünwald, remains uncovered or becomes covered with the epithelium of the drum. KATZ's advice to remove this protrusion with a snare has been practised for many years. Between the superficial layers of the tumor distinct nests of leucocytes (pustules) can be formed. DENKER.

313. A woman, aged twenty-one, became ill with morb. macul. Werlh.; hemorrhages occurred from the right external ear; in the left there were hemorrhages and a purulent otitis. BRÜHL.

314. Ear diseases form a large or complicating factor in producing the high mortality during the first year of life. Acute and chronic middle-ear suppurations are the commonest ear conditions. Discharge from the baby's ear should not be neglected. A cause should be ascertained in each case. This is usually the exanthemata or adenoids. Early proper treatment can prevent complications. This consists of the application of heat and cold, early paracentesis, and suitable treatment of the naso-pharynx. Politzerization should be condemned.

ARNOLD KNAPP.

315. The discharge in 58 cases showed the presence of the streptococcus in 14, diplococcus pneumoniæ (Fränckel) in 12, staphylococcus in 9, pyocyaneus in 6, colon bacillus alone in 2, associated with diplococcus pneumoniæ in 3; in the rest these bacteria were found in combination.

The presence of the diplococcus pneumoniæ assures a speedy cure and allows the mastoid wound to be sewn up completely. In streptococcus injection, cure takes place in fifty per cent.; in coli bacillus, the case, however, is practically incurable. Great weight is laid on the value of very hot-water syringing in the treatment of purulent otitis. ARNOLD KNAPP.

316. The notes were read at a meeting of the Queensland branch of the British Medical Association on September 7, 1900. The patient one day complained of acute pain in the left ear. The pain, after continuing spasmodically for some hours, became agony. The membrane was found bulging and was incised, clear fluid escaping. The pain was at once relieved. The following day, pain was experienced in the right ear; a large bulla was seen on the posterior meatal wall, and was not implicating the membrane, which looked healthy. On puncturing this bulla, clear fluid fizzed out with such force as to cause a perceptible noise. The pain was relieved, but shortly returned, when the middle ear was found affected. The membrane was then punctured, with immediate relief. Cover-glass preparations examined by Pound showed the bacillus aërogenes capsulatus. As the bacillus is anaërobic, peroxide of hydrogen was used in treatment with a good result. ARTHUR CHEATLE.

b.—CHRONIC PURULENT OTITIS.

317. **Leutert.** What is the present position as regards the treatment of chronic purulent otitis, and what is the latest opinion on cholesteatoma? *Münch. med. Wochenschr.*, Nos. 39–41, 1900.

REPORT ON THE PROGRESS IN OTOLOGY DURING THE FOURTH QUARTER OF THE YEAR 1900.

BY DR. A. HARTMANN.

Translated by Dr. ARNOLD KNAPP.

PHYSIOLOGY OF THE EAR.

284. **Adler.** On Flourens's experiment with the semicircular canals. *Monatschr. f. Psychiatrie*, Dec., 1900.

285. **Adler.** The vestibular reflex; the relations of the cerebellum to this and to the reflex tonus. *Ibid.*

286. **Dreyfuss.** Experimental study on the non-acoustic function of the ear labyrinth. *Pflüger's Archiv f. d. ges. Phys.*, vol. lxxxi., 1900.

287. **v. Stein.** A new independent apparatus to regulate automatically the ocular movements. *Centralbl. f. Physiolog.*, Aug. 4, 1900.

284. ADLER gives his views on the apparent movements which set in on irritation or cessation of action of each circular canal, and agrees with Ewald's theory. If the right external canal is divided, as the activity of the tonus labyrinth is constant, the right is arrested and the left receives increased stimulation, an apparent movement results, the head is turned to the left, which is followed by a reactive reflex head movement to the right. If the two posterior are divided, the two anterior preponderate, and the head turns back again; if the anterior are divided, the head falls forward. DREYFUSS.

285. ADLER endeavors to explain the relations between the cerebellum and the vestibular apparatus and to the reflex tonus. DREYFUSS.

286. This is a supplementary study to Ewald's well-known investigations. After describing the symptoms of the rotatory vertigo in the normal animal (guinea-pig), experiments on animals

with one-sided or two-sided loss of labyrinth are carefully detailed. Two phenomena are especially striking—the relaxation of the entire voluntary muscular apparatus and the absence of rotatory vertigo,—both of which can be explained by loss of tonus. The marked vertigo following one- or both-sided removal of the labyrinth can be easily explained by the theory of the tonus labyrinth. The terminations of the vestibular nerve in the acoustic hairs are the organs of static sense which inform us of rotatory movements and, in general, of our position in space. This results from the vestibular terminals transmitting a permanent tonus to all the striated body muscles. A number of clinical cases are added to show the absence of muscular tone and the unfavorable influence exerted by the loss of the tonus labyrinth in certain deaf-mutes on the muscles of speech and voice. Disturbances of co-ordination in the tabetic may be partly due to an atrophy of the vestibular nerve. DREYFUSS.

287. v. STEIN has made a number of experiments on healthy persons and on those with ear disease, in rotation on the turning disc, which confirm in general well-known phenomena of rotatory vertigo. According to the reviewer, however, he has not succeeded in establishing a new independent apparatus which regulates automatically the ocular movements. DREYFUSS.

GENERAL.

a.—REPORTS AND GENERAL COMMUNICATIONS.

288. **Haug** and **Laubinger.** Report of the University Ear Clinic in Munich for 1899. *Arch. f. Ohrenhlk.*, vol. l., p. 182.

289. **Reik, H. O.** Report on the examination of the ears of 400 school children. *Bulletin of the Johns Hopkins Hospital*, Dec., 1900.

288. 2917 patients were treated; 12 radical and 21 Schwartze operations were performed. BRÜHL.

289. A deficiency of hearing was detected in 45, or 10%. This was relieved in 13 by removing the accumulated cerumen. The remaining 32 showed the results of former ear disease or present abnormal conditions in the ear, nose, and throat, which would require treatment at the hands of an aurist. The upper tone-limit was examined in those able to give reliable answers and found to be somewhat higher than is usually given, and averaged 0.6 on the Galton whistle. The report closes with some interesting observations on the study of the auricle and its peculiarities; the abnormalities are given in a table. ARNOLD KNAPP.

b.—GENERAL SYMPTOMATOLOGY AND PATHOLOGY.

290. **Rhese.** Sympathetic ear disease. *Deutsche medic. Wochenschr.*, No. 46, 1900.

291. **Sendriak.** Sypilitic primary lesion in the mouth, pharynx, nose, and ear. *Monatschr. f. Ohrenhlk.*, No. 11, 1900.

292. **Cozzolino.** A case of pseudo-actinomycosis of the external ear, produced by a new thread bacterium. *Arch. f. Ohrenhlk.*, vol. l., 1900.

293. **Burnett, Charles H.** Chronic ear-vertigo (Ménière's disease); its mechanism and surgical treatment. *Philadelphia Medical Journal*, Sept. 22, 1900.

290. RHESE reports three cases where removal of the hammer adherent to the labyrinth wall produced an improvement in the hearing of both ears. In two of these cases the chain of ossicles on the non-operated ear was not interrupted. Rhese believes that here the extraction of the hammer destroyed the synergic action of the tensor tympani in the other ear and caused the improved hearing and arrest of subjective noises. In the third case, however, the ossicular chain was interrupted and Rhese thinks that as both acoustic nerves anastomose with one another, inhibitory stimuli are transmitted through the tympanic plexus to the sound-perceiving part of the other ear. NOLTENIUS.

291. SENDRIAK collected 118 cases of primary lesion in the nose. The external site was usually on the alæ, internally on the septum, from an infected finger. In the naso-pharynx, the chancre occurred 88 times, nearly always the result of catheterization; 71 of these were described in French literature. This affection has only been reported 28 times on the external ear and twice in the canal. KILLIAN.

292. This patient, described in volume xlvi. of the *Arch. f. Ohrenhlk.*, was taken ill, after two months of apparent health, with swelling of the neck, and died from meningitis. The autopsy showed extension of the purulent process along the lower plane of the temporal bone, thrombo-phlebitis of the venous carotid plexus and lateral sinus. Cultures of the blood showed the same resisting bacterium as the periauricular foci. BRÜHL.

293. Chronic ear vertigo, or Ménière's disease, is considered by BURNETT to be due to a mechanical cause, consisting chiefly in impaction of the stapes in the oval window. The object of the operation is to remove the retractive force producing the pressure, and thereby liberate the stapes, which will cure the disease. This is accomplished by a removal of the incus, which breaks the re-

tractive force of the tensor tympani and malleus exerted through it upon the stapes, and the latter bonelet is thereby relieved. While the production of ear vertigo in purulent cases is somewhat different from that seen in chronic catarrhal otitis, Burnett thinks that its mechanism is the same. In addition to removing the incus, it is necessary to excise the remnants of the diseased drum, the malleus, and whatever synechiæ are present before the stapes is freely liberated. In all, the operation has been performed twenty-seven (27) times for aural vertigo, mostly in chronic catarrhal otitides, and in no instance has it failed to give relief. No serious reaction has ever been encountered in either class after the operation. J. B. CLEMENS.

c.—METHODS OF EXAMINATION AND TREATMENT.

294. **Lucae.** On bone-conduction. *Arch. f. Ohrenhlk.*, vol. l., p. 187.

295. **Gellé, Georges.** Bone-conduction in nervous patients. *Arch. Internat. de laryng., d'otol.*, etc., vol. xiii., No. 5.

296. **Stenger.** Objective determination of one-sided deafness with tuning-forks. *Arch. f. Ohrenhlk.*, vol. l., p. 197.

297. **Jürgens.** On the value of percussion in the diagnosis of mastoid disease. *Monatschr. f. Ohrenhlk.*, No. 11, 1900.

298. **v. Stein.** Phenosalyl in laryngeal tuberculosis and in diseases of the nose and ear. *Klin. therap. Wochenschr.*, No 43, 1900.

299. **Lockard, Lorenzo B.**, Pasadena, Cal. The Eustachian bougie. *N. Y. Med. Jour.*, Dec. 29, 1900.

295. GELLÉ tested the hearing duration for tuning-fork a′ in neurotic individuals with unaffected hearing, and compared it to the normal. In all, the duration was found shortened, and in the neurasthenics and hysterical the hearing duration became less on successive examination, while the opposite obtained in the melancholiacs and paranoiacs. Gellé believes the diminished durations to be due in all cases to inattention, associated with the psychic or nervous troubles. SCHWENDT.

296. If two equally vibrating forks be held at different distances from both healthy ears, the nearest fork alone will be perceived. If an ear is supposed to be deaf, a fork c′ is held 5 *cm* from this ear, another fork is approached to the healthy ear; if the former be deaf, the latter will hear the fork at a greater distance, or *vice versa.* BRÜHL.

297. JÜRGENS, after accurate tests, concludes that percussion of the mastoid has no diagnostic value. KILLIAN.

298. v. STEIN uses a 5 % phenosalyl solution in glycerine in

a fistula in the extreme upper opening. This has persisted for two months. A probe introduced enters the attic. There is very little discharge, at times none. The drum membrane has entirely healed up.

I suppose the gentlemen of the Section have had many such cases, but I thought they might be interested and wish to look at it. The tube is quite patulous. The incus is in situ. I am in doubt as to whether I am justified in cutting down upon it without further symptoms being present.

Dr. HERMAN KNAPP, on being asked, said: I have had more experience in these cases than I liked. They may last for years, sometimes they will close, and later present themselves with an abscess formation, which, when opened, will heal up quickly and permanently. Probably the majority of them require only ordinary dressing and curettement to cicatrize smoothly and permanently. Other cases again will be covered with apparently healthy cicatricial tissue, but secretion will burrow underneath it and downward, forming a new crater, which will lead the probe to more deep-seated bare bone, necessitating scraping away the hard granulations between the two fistulas and resuming the treatment until, with a good deal of patience, a permanent, healthy cicatrization is brought about.

Presentation of a case of **brain abscess; operation, recovery.**

Dr. JAMES F. MCKERNON: This is a case of temporo-sphenoidal abscess which was operated upon February 8th. I saw the case on the 7th of February, and the symptoms present at that time were a very marked purulent discharge from the external auditory meatus, partial coma, temperature 97° F., pulse 54, respiration 16. The eyes were not examined, there being no facilities for an examination at that time. Upon removing the pus from the external auditory meatus, nothing could be seen in the deeper part at all except prolapsus of the superior and posterior wall, which came in contact with the lower wall. It was learned that the discharge had existed over a period of thirteen years.

The probable diagnosis was made of brain abscess. No effort at location was attempted. Operation was advised and performed the following day. Previous to the operation a probe was passed into the external auditory meatus, and encountered exposed bone over the inner tympanic wall; this was verified later, when it

could be seen where the destruction had taken place. Previous to the operation the discharge from the external auditory meatus was examined by the pathologist, Dr. Dixon, who reported that there were present a large number of streptococci, also some diplococci and staphylococci. The ordinary mastoid operation was performed. The mastoid was found to be as hard as ivory. Practically there was no mastoid antrum, its place being taken by hard bony tissue. Feeling sure that there was a collection of pus in the cerebrum, the incision was extended forward over the temple and the flap drawn upward. I found here softened bone directly over the roof of the tympanum extending upwards about 1½ inches. A large collection of epidural pus was found beneath this bone. After its removal the dura bulged unusually into the wound. It was incised sufficiently to admit a grooved director, which passed inwards and upwards for about two inches. When it was withdrawn there followed no pus. The incision was then enlarged and the index finger introduced between two and three inches along the director when it came in contact with soft tissue and, upon its withdrawal, a discharge of pus followed. About four or five drachms of pus were evacuated, together with broken-down brain tissue. The cavity was irrigated with a hot saline solution and the patient taken back to bed, and no unpleasant symptoms followed for forty-eight hours. After irrigation, this cavity was packed, according to the method of Macewen, with gauze rolled in equal parts of iodoform and boric acid. The morning following the operation the pulse had increased from 54 to 82 or 86, and the respiration was normal. Previous to the operation the patient had complained somewhat of dimness of vision on that side, and light pains on both sides. The attending physician told me that aphasia was present. Forty-eight hours after the operation there was a slight rise in temperature (100.5 °) with a correspondingly increased pulse rate. The dressings were removed, and a small amount of pus was found with quite a little serous discharge. The wound was again packed in the same manner as before with gauze rolled in a powder of equal parts of iodoform and boric acid, and this was left in for four days. The temperature dropped to 99°, and the pulse ranged from 75 to 86. This was six days after the operation. Owing to a suggestion made in this Section some weeks previous, I determined to try drainage by the use of tubes. The cavity was irrigated with the hot saline solution and a moderately

338. **Spencer, W. G.** Case of progressive sinking of the bridge of the nose following bilateral hæmatoma of the septum. *Proc. Laryng. Soc.*, London, Nov. 2, 1900.

339. **Snydacker, E. F.** Post-operative treatment after removing spurs of the nasal septum. *N. Y. Med. Journ.*, Dec. 29, 1900.

336. Report of a case of bilateral hæmatoma of the septum after influenza. KILLIAN.

337. The abscess is usually localized in the anterior segment of the septum. Necrosis of cartilage need not follow. Six cases are reported. SACHER.

338. A boy, two years previously, had had a fall on his nose; there was then no displacement nor fracture of the nose, but on each side there was a well marked hæmatoma, just within the anteiror nares. The hæmatoma was absorbed without suppuration and the nose appeared unaltered. A month ago the boy was again seen as a progressive sinking of the bridge was taking place. On examination the septum was found twisted, the mucoperiosteum thickened, and the passages much narrowed. There was no evidence of inherited syphilis, but it was impossible to exclude it with certainty. The mother had had miscarriages and dead children. ARTHUR CHEATLE.

339. SNYDACKER makes a strong plea for the careful post-operative treatment of the wound caused by the removal of the spur, since granulations spring up which either become cicatricial or rather occupy fully as much space as the original obstruction. By removing the crusts, cauterization of the granulations, and the use of vaseline, or, better, lanoline, this can be obviated.

M. TOEPLITZ.

e.—ACCESSORY CAVITIES.

340. **Brühl.** Anatomy of the nasal accessory cavities. *Berl. klin. Wochenschr.*, No. 41, 1900.

341. **Wertheim.** On affections of the accessory cavities of the nose. *Arch. f. Laryng.*, vol. xi., 2.

342. **Avellis.** The origin of the non-traumatic mucocele of the frontal sinus. *Arch. f. Laryng.*, vol. xi.

343. **Halle.** The treatment of empyema of the antrum of Highmore. *Berl. klin. Wochenschr.*, No. 35, 1900.

344. **v. Stein.** A new needle for puncture of Highmore's antrum. *Monatschr. f. Ohrenhlk.*, No. 10, 1900.

345. **Struycken.** An aid in probing the frontal sinus. *Arch. f. Laryng.*, vol. xi.

346. **Glatzel.** On probing the frontal sinus. *Arch. f. Laryng.*, vol. xi., 1.

347. **Clark, J. Payson.** Bullous enlargement of the middle turbinated bone (concha bullosa). *N. Y. Med. Jour.*, Oct. 20, 1900.

348. **Duel, Arthur B.** A case of empyema of the antrum of Highmore, due to a foreign body; operation; recovery. *N. Y. Med. Jour.*, Dec. 1, 1900.

340. BRÜHL describes a method by which the cranial bones are made transparent and the cavities are filled with a metal alloy, thus demonstrating the topography and dimensions of the accessory sinuses. A number of skulls were examined, and practical deductions were drawn therefrom regarding accessory-sinus disease. MÜLLER.

341. This extensive article is based on the results of 400 autopsies, with special regard to diseases of the nose and accessory cavities. It is only possible to give a brief outline of this very interesting paper. A nasal empyema was present in every fourth body. The maxillary and sphenoidal sinuses were most frequently combined; the combination of frontal and maxillary sinuses comes next. Every second individual succumbing to an infectious disease showed an empyema of one or more cavities. Vomited matter was found 12 times in the accessory cavities. Ozæna was present in 5; of which 3 had sinus affections. The author concludes that the latter was not the result of ozæna, but an associated condition. Acute suppurations usually recover of themselves with symptomatic treatment. The author, therefore, is inclined to regard the chronic suppuration as generally primarily chronic. An examination of 10,394 autopsy reports showed the relatively benign character of accessory-sinus disease. Six brain abscesses are described in detail.

The author is adverse to the extreme opening of the maxillary sinus, and practises irrigation through the alveolus. Brieger has abandoned the temporary resection of the anterior walls of the frontal sinus for Kuhnt's method. Conservative intranasal treatment is not sufficient. The author found serous exudates in 48 cases, chiefly in the sphenoid. The study of this valuable paper is recommended to every rhinologist. ZARNIKO.

342. A girl, twelve years old, had a painless non-inflammatory swelling near the inner canthus of the eyelids for 1½–2 years. Incision evacuated tenacious, gray muco-purulent fluid. The lower turbinal was normal, the middle separated from the median wall, the floor of the ethmoid visible, smooth, and distended. The operculum of the middle turbinal was removed and the ethmoid opened. The incision near the eyelids was dilated, and

the cavity evacuated. The walls were smooth, gray; extension 4–5 *cm* backward. Recovery. AVELLIS thinks that the frontal sinus was not affected, but that a cystic osseous cell in the anterior ethmoid labyrinth has displaced the frontal sinus, similar to a dentigerous cyst, and the maxillary antrum. Treatment of non-traumatic mucocele of the frontal sinus should first be attempted by way of the nose. ZARNIKO.

343. HALLE prefers Krause's method to opening through the canine fossa or the alveolus: 1. The operation is not difficult and can be done without anæsthesia. 2. Communication with the mouth is avoided.' 3. The patient is not annoyed by the constant taste of pus and iodoform. 4. Recovery takes place usually in a shorter time. MÜLLER.

344. The needle is very much curved, very long, and does not appear to us to be very practical. STEIN observed subsequent emphysema of the eyelids and cheeks in two cases. KILLIAN.

345. STRUYCKEN employed a probe with a steel extremity, which is magnetized. With a small compass brought near to the frontal sinus the location of the probe can be determined.
ZARNIKO.

346. GLATZEL regards the above methods as faulty, and thinks that an exact orientation of the position of the probe is only possible with the actinoscopic examination. ZARNIKO.

347. CLARK reports two cases, occurring in women, æt. forty-five and twenty-two respectively, who complained of nasal obstruction, severe headaches, and, in the first case, diminution of the sense of smell. The removal of the middle turbinate, which measured 33 : 15 : 12 *mm* and 37 : 18 : 17 *mm* respectively, by means of the cold snare, cured the patients entirely. Clark found, besides two more of his own not fully described cases, 20 cases reported by others, viz., 24 in all, of which 20 were in women, 3 in men, and 1 without mention of sex; 17 patients were over twenty years of age, the youngest sixteen, and 5 over thirty. A complete bibliography is appended. M. TOEPLITZ.

348. The patient, DUEL'S, a woman, had, in March, 1884, a right upper molar extracted, which was broken, the jaw being splintered. The wound closed, nasal discharge ensued. In August, 1885, the antrum was opened through the alveola, and irrigations kept up for five years. In February, 1890, the alveolar opening was allowed to close, but the nasal discharge continued.

In 1895, the removal of portions of the middle turbinal relieved the patient of acute symptoms. In the spring of 1898 the canine fossa was opened by Duel, to permit the entrance of a finger. A calculus of the size of a pea was washed out, the nucleus consisting of the fang of a molar tooth. The patient was cured in four weeks. Duel prefers the opening through the canine fossa for cases of antral empyema of long standing. M. TOEPLITZ.

f.—OTHER NASAL AFFECTIONS.

349. **Breitung.** A case of foreign body in the nose. *Münch. med. Wochenschr.*, No. 47, 1900.

350. **Eckert.** A case of nasal rhinorrhœa. *Eschmedelnik*, No. 50, 1900.

351. **Cohen-Kysper.** Pathology and treatment of asthma. *Deutsch. med. Wochenschr.*, No. 46, 1900.

352. **Baurowicz.** Congenital bilateral occlusion of the choanæ. *Arch. f. Laryng.*, vol. xi.

353. **Squires, G. W.** An unusual case of nose-bleed owing to a non-recognized foreign body. *N. Y. Med. Rec.*, Dec. 22, 1900.

354. **Foster, Hal.** The removal of thirty-five screw-worms from the nose. *N. Y. Med. Rec.*, Dec. 22, 1900.

355. **Holmes, Christian R.** Hypertrophy of the turbinated bodies. *N. Y. Med. Journ.*, Oct. 13, 1900.

349. Removal of a button which had been pushed deeper by previous attempts. SCHEIBE.

350. The patient, thirty-nine years old, was taken ill with fever, irritation in the nose, and a profuse watery discharge. On bending the head forward, the discharge appeared in drops and in a thin stream; measuring 120 *ccm* in twenty-four hours. Beyond a diffuse bronchitis the patient appeared to be perfectly well. The fluid was transparent, colorless, slightly alkaline, spec. grav. 1.0063, solids 0.96%, salts 0.83%, sodium chlorid 0.707%, albumen 0.025%; no mucin nor sugar; microscopically leucocytes and epithelium. No improvement by treatment. SACHER.

351. COHEN-KYSPER believes that an obstruction to nasal breathing is always a factor in the causation of asthma. Even a slight obstruction may cause in chronic cases a hyperæsthesia of the respiratory muscular sensibility, etc. The author removes every obstruction and in narrow noses resects the lower border of the inferior turbinal. NOLTENIUS.

352. Description of a case with literature. ZARNIKO.

353. The bleeding occurred in a man, æt. fifty, and could only be controlled by anterior and posterior plugging which had

to be kept up for ten days. It ceased entirely after two months. On scratching the nose about four months afterwards a point was felt through the skin on the outside of the right nostril, and a rusty needle, an inch long, broken off near the eye, was extracted. M. TOEPLITZ.

354. A man, æt. seventy-two, whose nose, eyes, and face were badly swollen, suffered from excruciating frontal headache and bloody and offensive discharge from the nose. Worms were found in the nose, the great majority in the posterior nares, which had badly injured the middle turbinate and had made quite a large opening in the hard palate. They had been in the nose for two weeks and were removed with chloroform. M. TOEPLITZ.

355. Hypertrophy of the middle turbinates compared with that of the inferior is quite infrequent and mostly secondary to empyema of the accessory cavities. For removing polypoid hypertrophies, the snare is sufficient; for that of a portion or of all the bone, the scissors devised by HOLMES are preferable to the alligator forceps. Holmes has also removed 105 spurs, 80 in the male and 25 in the female. Among his 1500 operations, 43 were made upon patients under ten years of age; the oldest patient was seventy. A number of good illustrations are inserted and a bibliography is appended. M. TOEPLITZ.

g.—NASO-PHARYNX.

356. **Tenier.** Dermoid polypi of the pharynx. *La presse médicale*, Dec. 19, 1900.

357. **Magenau.** The so-called vertebra prominens of the naso-pharynx. *Arch. f. Laryng.*, vol xi.

358. **Halsted, T. H.** Anæsthesia in children with adenoids, and in the adenoid operation with special reference to the dangers of chloroform in children of the lymphatic diathesis. *Phila. Med. Journ.*, Nov. 3, 1900.

356. A newly-born child, on coughing, protruded a pedunculated growth larger than a bean from the mouth; the tumor arose from the right side of the naso-pharynx. It was removed with the snare, and on examination proved to be composed of cutis tissues, probably a dermoid tumor from a branchial arch. SCHWENDT.

357. This is a very thorough exposition on the subject of the so-called prominent vertebra in the naso-pharynx, without furnishing anything particularly new. ZARNIKO.

358. HALSTED arrives, among other conclusions, to the following: Children with adenoids present the lymphatic diathesis;

they are in depressed general health and badly resist all heart depressants, such as chloroform, which is not comparatively safe, but should be feared during childhood. Adenoid operation in children under twelve years of age, without general anæsthesia, produces shock. Ether is incomparably safer than chloroform for these operations. M. TOEPLITZ.

SOFT PALATE, PHARYNX, AND BUCCAL CAVITY.

359. **Besançon** and **Griffon.** The pneumococcus in anginas. *La presse médicale*, Oct. 24, 1900.

360. **Mayer.** Angina caused by Friedländer's bacillus. *Arch. f. Laryng.*, vol. xi.

361. **Derenberg.** Treatment of lateral pharyngitis with electrolysis. *Arch. f. Laryng.*, vol. xi.

362. **Töpfer.** Muscle and cartilage in tonsils. *Arch. f. Laryng.*, vol. xi.

363. **De Blois, Thomas Amory.** A case of superimposed uvula. *N. Y. Med. Journ.*, Dec. 22, 1900.

359. These authors have examined ten cases of non-diphtheritic angina and found the pneumococcus present in varying quantity. In some, the pneumococci preponderate, in others the streptococci; again in others various cocci were present (angines polymicrobiennes). SCHWENDT.

360. Pseudo-diphtheritic, chronic recurring pharyngitis with Friedländer's bacillus present in the membranes. ZARNIKO.

361. DERENBERG has treated seven cases of lateral pharyngitis with the electrolytic double needle. The reviewer cannot see any advantage in the method and prefers galvano-caustic punctures or chemical cauterization. ZARNIKO.

362. TÖPFER found a muscular fibre in a tonsil removed for hyperkeratosis lacunaris. It was situated in a connective-tissue septum and was probably a proliferation of one of the muscles which have their insertion in the capsule of the tonsil. Islets of hyaline cartilage were also present. The author found cartilage in ten additional tonsils, and considers them an example of heterologous formation of cartilage out of fibrillary connective tissue.

ZARNIKO.

363. The halves of the uvula hung one in front of the other, not side by side. The left anterior pillar was connected with a perfectly formed uvula, but from the left posterior pillar, which on that side had an extra fold, hung a second uvula.

M. TOEPLITZ.

REPORT ON THE PROGRESS IN OTOLOGY DURING THE FIRST QUARTER OF 1901.

ANATOMY AND PHYSIOLOGY.

1. **Alexander.** Anatomy of the vestibular ganglion in mammals. *Sitzungsbericht der Kaiserl. Akad. der Wissenschaften zu Wien*, vol. viii., part iii., Nov., 1899.

2. **Wulf.** On the dimensions of the semicircular canals in vertebrates. *Arch. f. Anat. u. Physiol.*, 1901, 1.

3. **Peter.** The closure of the ear depression in the lizard. *Arch. f. Ohrenhlk.*, vol. li., p. 126.

4. **Panse.** The organ of hearing in the Japanese dancing mouse. *Arch. f. Anat. u. Phys.*, 1901, 1, 2.

5. **Denker.** On the comparative anatomy of the ear in mammals. *Ergebn. der Anat. u. Phys.*, 1901, 1, 2.

6. **Ostmann.** On the motility of the drum membrane and hammer. *Arch. f. Anat. u. Phys.*, 1901, 1, 2.

7. **Marage.** The rôle of the ossicles in hearing, with application to treatment of deafness and tinnitus. Published by the author, rue Duphot, Paris.

8. **Schaefer** and **Abraham.** On interference tones. *Arch. f. ges. Phys.*, vol. lxxxiii.

9. **Richter.** New laws on the stimulation of sensory nerves and two new electrodes for the ear and eye. *Monatschr. f. Ohrenhlk.*, No. 12, 1900.

1. ALEXANDER gives a very complete description of the acoustic ganglion in a large number of mammals and man.

DENKER.

2. WULF has measured the semicircular canals, ampullæ, their cubic contents, and the relations of the membranous to the bony parts in fish, amphibia, reptiles, birds, and mammals. The bony canal is always (1–20 times) larger than the membranous, which is always loosely attached on its outer side. BRÜHL.

4. PANSE does not consider the defective development of the cochlea to be the cause for the turning; the site is rather in the cerebellum. Corti's organ and the semicircular canals presented no anomaly. BRÜHL.

6. OSTMANN connected the head of the malleus with the kymographion during changes of pressure in the auditory canal and confirmed the following propositions of Helmholtz: 1. The handle of the malleus can be forced inward until the radial fibres of the drum are drawn tight; if the pressure continues, they would become curved and pull the manubrium outward. 2. The malleus makes a small turn with its head toward the incus.

BRÜHL.

7. The excursions of the stapes which Helmholtz found to be $\frac{1}{10}$ *mm.*, are not over $\frac{1}{1000}$ *mm.*, according to the author. The instrument used for these experiments was a siren which produced the most important tones of the vowels. With aid of a manometer, the smallest air pressure necessary to produce a given vowel could be determined. The new treatment consists in massage of the drum, with vibrations of the same amplitude as the tones composing the spoken vowels. SCHWENDT.

9. RICHTER uses an electrode like an aural catheter, the second electrode is conical and is placed in the external canal. KILLIAN.

GENERAL.

a.—REPORTS AND GENERAL COMMUNICATIONS.

10. **Kessel.** Oration on the opening exercises of the new Ear Clinic in Jena on Dec. 14, 1900. *Arch. f. Ohrenhlk.*, vol. li., p. 177.

11. **Alt.** Report of cases. *Monatschr. f. Ohrenhlk.*, Nos. 1 and 2, 1901.

12. **New York Eye and Ear Infirmary.** *Eighteenth Annual Report*, for the year ending September, 30, 1900. Aural Surgeons: Bacon, Dench, Adams, Whiting, McKernon.

13. **Manhattan Eye and Ear Hospital.** *Thirty-first Annual Report*, for the year ending September 30, 1900. Aural Surgeons: Roosa, Pomeroy, Webster, Emerson, Lewis, Hepburn, Clemens, Phillips, Berens.

14. **New York Ophthalmic and Aural Institute.** *Thirty-first Annual Report*, for the year ending September 30, 1900. Aural Surgeons: Knapp, Toeplitz, Coburn, Jordan.

15. **Minor, J. L.**, Memphis. The ear as a factor in causing systemic disturbance. *N. Y. Med. Jour.* Dec. 29, 1900.

16. **Amberg, E.**, Detroit. Some remarks on the hygiene of the ear. *Philadelphia Med. Jour.* Dec. 15, 1900.

17. **Lauterbach, L. J.** The control and prevention of ear diseases among school children. *Journal of the Am. Med. Assoc.*, Dec. 22, 1900.

10. The number of out-door patients has increased from 517 in 1887, to 1372 in 1899, in-door patients from 62 to 332, operations from 58 to 398. The new clinic has 27 rooms and accommodations for 40 patients. DENKER.

11. An aneurism of a branch of the interior maxillary artery of the size of a cherry-pit caused a pulsatory blowing murmur, of musical character, which disappeared after removal of the aneurism. Two cases of labyrinth disease after mumps were cured without treatment. A case of diplacusis echotica is reported. Every tone below g^1 was heard double, probably due to a retarded hearing in one ear with refracted drum and tubal

stenosis. Very complicated disturbance of the musical hearing in a musician after a blow on the ear causing rupture of the drum. A case of cerebellar abscess and one of sclerosis improved by an acute otitis are reported. KILLIAN.

12. Number of ear patients, 9843; operations, 1722; paracentesis of membrana tympani, 693; ossiculectomy, 17; mastoid operation, 263; Stacke operation, 4; cerebral abscess, 2; evacuation of cerebellar abscess, 3; epidural abscess, 26; thrombus of sigmoid sinus, 12; thrombus of internal jugular, 4; removal of granulations and polypi, 160; removal of adenoids, 211. CLEMENS.

13. Number of ear patients, 4001; throat patients, 3167; operations, 941; operations on nose and throat, 1446; mastoid operation, 75; opening of lateral sinus, 6; cerebral abscess, 2; paracentesis of membrana tympani, 45; ossiculectomy, 6; excision of internal jugular, 2; removal of granulations and polypi, 10; removal of adenoids, 572. CLEMENS.

14. Number of ear patients, and those of nose and throat in relation to the ear, 3053; operations, 505; mastoid operations, 43; paracentesis of the membrana tympani, 97; removal of aural polypi, 61; nasal, 19; removal of adenoids, 147; sinus thrombosis and ligation of jugular vein, 1; cerebral abscess, 1; epidural abscess, 1; ossiculectomy, 1; incision of furuncle, 35. CLEMENS.

15. The author draws attention to the great frequency of ear disease in children, and as the general symptoms often outweigh the local ones the ear is often overlooked as the cause. The symptoms and treatment of otitis media purulenta are described. Illustrative of remote or systemic ear symptoms the following cases are cited:

CASE 1 was an acute suppurative otitis in a woman of twenty-three, whose cerebral symptoms, convulsive seizures, and delirium were relieved after paracentesis had been performed.

In CASE 2, acute intestinal derangements with cerebral symptoms in a child, one and a quarter years old, were relieved by treatment of the acute otitis.

CASE 3 was that of a child, eight years old, which suffered from septic fever and earache following measles, and was cured by treating the ear troubles.

CASE 4.—A child, fourteen months old, was ill with a continuous high fever which could not be accounted for until the acute otitis media was discovered and treated with relief.

In Case 5, a child of eight suffered from attacks of "bilious fever," which proved to be due to exacerbations, with retention of pus, of an old purulent otitis. Arnold Knapp.

16. After speaking of the close connection between the nose, throat, and ear, and the importance of recognizing adenoids, the author advocates the proper consideration by people who are deaf of the aids to hearing, such as lip-reading, etc. More attention should be paid to the ears during the infectious diseases. Hygienic rules in general are of great importance in the prophylaxis of ear diseases,—breathing pure air, an equable temperature, and avoiding dust. Attention is drawn to the abuse of drugs, especially quinine, and the danger of loud noises, as on July 4th. Proper care of the mouth and teeth and respiratory exercises should not be neglected. Arnold Knapp.

17. The importance of hearing for the mental development of the child is not sufficiently kept in mind. Deafness or partial impairment of hearing is not rare in school children; according to statistics, defect of one third or more in both ears occurs in 7 per cent., or 13–25 per cent. in one ear. The hearing of each pupil should be tested and questions asked to detect any disease of the ear or throat. This should be done by the teacher, or preferably by a school physician. Thus incipient troubles can be detected, when prompt treatment can cure. Enlargements in the throat and nose and catarrhal conditions should be observed.

Arnold Knapp.

b.—GENERAL PATHOLOGY.

18. **Citelli.** Bacteriological examinations of the healthy middle ear. *Archiv. ital. di otolog.*, vol. xi., No. 1.

18. The author describes his bacteriologic examinations of the middle ear in fifteen dogs and five cats. The healthy middle ear was usually found free from germs. The Eustachian tube is not in the estimation of the author, a certain safeguard against the invasion of micro-organisms from the naso-pharynx. Rimini.

c.—METHODS OF TREATMENT.

19. **Ostmann.** Experimental investigations on the massage of the ear, Part iii. On the therapeutic value of vibratory massage in the deaf. *Arch. f. Ohrenheilk.*, vol. li., p. 81.

20. **Lucae.** On vibratory massage of the aural canal. *Arch. f. Ohrenheilk.*, vol. li., p. 1.

19. OSTMANN, to test the value of vibratory massage, examined the hearing with the voice and continuous tone series before and after treatment ; also the effect on the subjective noises, in deaf persons with disturbance of sound conduction from (1) partial loss of drum, malleus, or incus, (2) sclerosis, (3) hypertrophic form of chronic aural catarrh, (4) cicatricial otitis media. In general, the value of vibratory massage is greatly restricted. In the cases of sclerosis, there was no improvement in hearing, and the tinnitus was temporarily relieved. In three cases of absence of drum and incus, the massage improved hearing for loud voice in one only. In one case, massage produced tinnitus of several hours' duration and headache.

A case of cicatricial otitis media was not improved ; another was made worse.

The results are best in the hypertrophic forms of chronic middle-ear catarrh. DENKER.

20. According to LUCAE, the chief value of the electro-pneumatic massage is that it enables us, in combination with Siegle's speculum, to test the motility of the drum and malleus. With the latest form of pressure probe, the sound-conveying apparatus in a normal ear can bear a weight of 300 g. without detriment. This instrument causes a much greater stretching of the ossicular ligaments than the massage. Lucae was able to produce a greater effect on the sound-transmitting apparatus by substituting for the ordinary massage apparatus one containing a non-compressible substance, like water, which in general was well borne by the patient.

Finally, the author describes his electro-pneumatic pressure probe, and believes to have had fairly good results in cases where the hydropneumatic massage has not availed. DENKER.

d.—DEAF-MUTISM.

21. **Haike.** Treatment of deaf-mutes and reform in the medical service in the deaf-mute institutions of Prussia. *Deutsche med. Wochenschr.*, No. 6, 1901.

22. **Borischpolski.** The psychic life of deaf-mutes. *Wratsch*, 8, 1901.

23. **Lannois** and **Levy.** Deaf-mutism. *Ann. des mal. de l'or., du lar.*, Jan., 1901.

21. It is well known that the medical supervision of deaf-mute

children is defective as regards knowledge of the ears, nose, and eyes. Recently it has been found that a greater part of deaf-mute children possess sufficient hearing power to receive instruction by ear, and that they should be separated from the totally deaf. It is equally important to remove the idiotic and feeble-minded from the deaf-mute school. During May, 1900, courses and lectures were given in Berlin to a number of physicians interested in the treatment of deaf-mutes. NOLTENIUS.

23. After a brief description of the pathogenesis of mutism in intact hearing, the authors report nine cases observed in children under ten years. A cure is only probable when proper course of instruction is begun. ZIMMERMANN.

EXTERNAL EAR.

24. **Chauveau.** Clinical cases. *Ann. des mal. de l'or., du lar.*, Feb., 1901.

25. **Swenzizki.** Chronic perichondritis of the auricle. *Chirurgia*, Nov., 1900.

26. **Iljin.** Bullous or hemorrhagic inflammation of the external ear. *Chirurgia*, Nov., 1900.

27. **Trautmann.** Removal of a large exostosis on the anterior wall of the auditory canal. *Arch. f. Ohrenhlk.*, vol. li., p. 193.

28. **Ljuri.** Traumatic injuries of the drum. *Wojenno-Medizinski Shurnal*, July, 1900.

29. **Mouselles.** A case of partial dry gangrene of the drum following traumatism. *Arch. ital. di otol.*, vol. xi., 2.

30. **Cheesman, Wm. S.** Cirsoid aneurism of the ear. *Buffalo Med. Jour.*, Jan., 1901.

31. **McKinney, Richmond.** Rupture of the membrana tympani from indirect violence, with concussion of the labyrinth and complete deafness. *Jour. Amer. Med. Assoc.*, March 9, 1901.

32. **Richards, Geo. L.** An unusual case of traumatic rupture of the membrana tympani. *Laryngoscope*, Nov., 1900.

33. **Cheatle, G. Lenthal.** A new operation for prominent auricle. *The Medical Press*, March 13, 1901.

24. In the first case, a child of seven years, a tumor developed in the lobule, which was easily removed, and proved to be a fibroma with cartilage cells. In the second case, together with herpes of the lips and pharyngeal mucous membrane, two vesicles appeared on the drum. Healing took place in four days, with the exudation of some bloody serous fluid. ZIMMERMANN.

25. After a fall on the ear, the auricle became very much swollen and an abscess developed. This was incised, the pain gradually let up, but the auricle remained enlarged and tender.

SACHER.

27. An exostosis 1½ *cm* long and ¾ *cm* broad, composed of three nodules, was removed with the chisel after detachment of the auricle and division of the membranous canal. The incision in the membranous canal and the cutaneous wound were closed with sutures. Healing took place after four weeks, with normal hearing. DENKER.

28. The number of ear patients in the Russian army is relatively large; 7 to 8 in 1000. From 1893 to 1897 in 100 diseases there were 21.3 ear affections; out of 1000 ill, 10.3 died of ear trouble, and 49.1 had to be excused from military service. In the etiology of ear troubles, traumatic injuries of the drum from blows on the ear occupy an important position. SACHER.

29. The patient, thirty-six years old, had a perforation in the upper and back part of the drum, following a blow on the ear. Fifteen days later the ear was syringed, the perforation having in the meanwhile closed and a part of the drum appeared paler. This segment then turned a dirty gray and was surrounded by a red line, and later a kidney-shaped perforation was present, which subsequently diminished in size. RIMINI.

30. The patient, female, had since childhood a cirsoid aneurism of the left ear, which began as a simple telangiectasis. The entire auricle was enlarged and protuberant, the lobe hanging low on the neck; throbbing and twisting arterial varices were visible everywhere. Pressure on the left common carotid controlled the pulsation, which was subsequently ligated above the tendon of the omo-hyoid muscle. Pulsation of the varices ceased at once. The employment of electrolytic needling proved unsatisfactory. After the carotid ligation the ear measured four inches in length, its fellow two and one half inches. About one year later a slight return of the pulsation was observed, and a plastic operation was undertaken to further reduce the size of the lobule. This was successfully accomplished, and although the auricle is now five eighths of an inch longer than its fellow, all pulsation has ceased. CLEMENS.

31. The patient, male, aged twenty-three, was hit over the right side of the head with a wagon-wheel spoke and was unconscious for fully a half hour afterwards. Hemorrhage from the ear and mouth followed at irregular intervals. Examination of the ear showed that the drum membrane, with the exception of the membrana flaccida, was intensely congested, and in the posterior quadrants was a large perforation, extending almost two thirds of

the drum's perpendicular diameter, which did not assume the usual oval shape seen in such cases, but was linear. Bone- and air-conduction were absent. The location of the blow and the continued expectoration of blood gave the impression of a fractured base. CLEMENS.

32. The patient, male, aged forty-three, fireman, was struck, while at a fire, by a stream of water, receiving nearly its full force on the side of the head at short range. He was knocked down and stunned, and when he recovered, he had pain in the ear, and a serous discharge from it, for a day or two. Four days after the accident an examination showed a triangular rupture in the posterior inferior quadrant. The canal was cleaned, and a fine gauze wick put in it, and in eleven days healing was complete. Deafness and tinnitus resulted, but were only transient. There is doubt whether the rupture was due to compression of air in the canal, or to the impact of the water against the membrana tympani. CLEMENS.

33. The case was shown at a meeting of the West London Medico-Chirurgical Society, held on March 1, 1901. The deformity was caused by excess in size and thinness of the antihelix. A crescentic portion of the antihelix and a small piece of the lower border of the helix were removed, the skin being then accurately sutured. The result was excellent.

ARTHUR CHEATLE.

MIDDLE EAR.

a.—ACUTE OTITIS MEDIA.

34. **Andrews, Albert H.** A new objective test for mastoiditis. *Journ. Amer. Med. Assoc.*, Jan. 26, 1901.

35. **Dench, Edward B.** The results of the surgical treatment of inflammation of the mastoid process. *Ibid.*, March 2, 1901.

36. **Knapp, Herman.** Suppurative tympano-mastoiditis in children. *Ibid.*, Feb. 23, 1901.

37. **Reik, H. O.** The value of formaldehyde in the treatment of suppurative otitis media. *Maryland Med. Journ.*, Jan., 1901.

38. **Williams, C. W.** The value of cataphoresis in caries of the temporal and other bones. *St. Paul Med. Journ.*, Jan., 1901.

39. **Calhoun, W. A.** Some observations in mastoid operations. *Journ. Amer. Med. Assoc.*, Feb. 23, 1901.

40. **Tuttle, T. D.** Mastoiditis. When does the disease begin and when shall we operate? *Denver Med. Times*, Jan., 1901.

41. **Spencer, W. G.** Arterial hemorrhage from the ear. *Brit. Med. Journ.*, April 27, 1901.

42. **Peter, Luther C.** Facial diplegia following middle-ear disease. *Pediatrics*, Nov. 15, 1900.

43. **McReynolds, Geo. S.** Report of twelve cases of mastoiditis and operation. *Maryland Med. Journ.*, Oct., 1900.

44. **Shackleton, W. L.** Two cases of mastoiditis. *Cleveland Med. Gazette*, Sept., 1900.

45. **Piffl.** On operations on the mastoid in complications of acute otitis media, with report of seventy-five operative cases. *Arch. f. Ohrenheilk.*, vol. li. p. 241.

46. **Rimini.** Acute mastoiditis after scarlatinous otitis. *Arch. ital. di otolog.*, vol. xi., 2.

47. **Tomka.** Hæmophilic hemorrhage from the ear. *Arch. f. Ohrenheilk.*, vol. li., p. 187.

48. **Katz.** Historical note to my paper on the excrescences of the drum in acute otitis media. *Ibid.*, vol. l. p. 211.

34. ANDREWS makes use of a tuning-fork and a stethoscope in determining the comparative density of the two mastoids, and offers it as a new method for diagnosing mastoiditis. The test is made by placing a small bell stethoscope over the mastoid tip, and a vibrating tuning-fork over the antrum. Should the cells be obliterated, or filled with pus or granulations, the sounds transmitted are perceived more distinctly than on the opposite or healthy side. In making the test care should be taken not to stretch the skin between the stethoscope and the tuning-fork, as the intensity of the vibration is increased thereby.

Forty cases without mastoid symptoms have been carefully examined with no perceptible difference in the resonance of the two sides, while in four cases of mastoiditis, the intensity was more marked on the diseased side. The fork used is c^2 512 v. s. and is so constructed that it is heard about thirty-five seconds in the normal ear. The stethoscope has a metal bell ($\frac{5}{8}$) five eighths of an inch in diameter. CLEMENS.

35. DENCH believes that the otologist is as much justified in exploring the mastoid cells for diagnostic purposes, whenever there is the slightest evidence of inflammation, as the general surgeon is for similarly exploring the abdominal cavity. This view is based on the fact that in those cases where the pneumatic cells are well developed it is very difficult and often impossible to make a positive diagnosis until the disease has existed for several weeks and sometimes for several months. An early exploratory operation at the first signs of inflammatory involvement in such doubtful cases, would bring relief more promptly, prevent extensive complications, and avoid a tedious convalescence.

Closing the superficial wound with sutures to hasten the recovery is considered of doubtful utility. Recovery is quite as rapid when the entire wound is treated by the open method, pus retention being thereby completely avoided. CLEMENS.

36. From a tabulated study of thirty-nine mastoid operations in children under eight years of age, KNAPP has found that the greatest number of cases of mastoid disease occurred in the second year. An early diagnosis and treatment of suppurative otitis media in children are most important. The temporal bone in the young, with the open state of the squamo-mastoid and petro-squamous sutures, and the comparative softness of its texture, are carefully considered. CLEMENS.

37. In order to thoroughly clean the tympanum and render that cavity sterile in cases of acute and chronic suppurative otitis, REIK thinks that formaldehyde is the best and the most satisfactory antiseptic. The disadvantages attending the use of bichloride of mercury and boric acid in such cases are fully considered. The strength of the formaldehyde used is equivalent to a 1 to 300 solution of formaldehyde gas, and is prepared by adding one drachm of the commercial solution of formaldehyde (40 %) to one pint of boiled water. Its use seldom causes discomfort, but as some ears are more sensitive than others, should it cause any pain it is better to reduce its strength by using only half a drachm to the pint of water.

While it is not claimed that formaldehyde will cure all cases of otorrhœa, Reik believes that good results will be accomplished with more certainty and in considerably less time through its use, than by any other antiseptic employed at the present time.

CLEMENS.

38. In this case WILLIAMS found a sequestrum, or what appeared to be such, in the middle ear while performing a paracentesis, and treated it in the following manner: After incising the membrana tympani freely he filled the auditory canal with dilute hydrochloric acid, U. S. P., placing the anode pole well wrapped with cotton into the auditory canal very near to or touching the drum, and the negative pole over the mastoid of the opposite side. The street current of 110 volts was only regulated by a selector. He used no milliampere meter but graduated the force of the current by the sensations of the patient, and he states that he successfully passed through the head a voltage of 36 to 40 for a period of thirty minutes. The use of the acid produced a

dermatitis, which, far from being harmful was really beneficial by increasing the collateral circulation. The case was cured and has remained so for the past three years. The same treatment has been successfully employed in disease of the antrum of Highmore.

CLEMENS.

39. Mastoid disease is found to be relatively infrequent in the Middle Atlantic States, when it is compared with the total number of acute and chronic middle-ear suppurations, and when seen the disease is of a mild type and generally free from cerebral and other dangerous complications. The negro race appears to be singularly exempt from mastoid disease, as the writer in all his experience recalls but one case. The radical operation is seldom required to cure seemingly severe cases of mastoid disease since good recoveries are made under milder measures. CLEMENS.

40. The results of TUTTLE's experience in treating mastoiditis are given in the following résumé : "In all cases of otitis media purulenta there is more or less involvement of the mastoid antrum. In acute otitis media, with symptoms of mastoiditis, we are justified in using palliative measures for twenty-four hours. To delay operative measures for more than twenty-four hours, without marked improvement, is not justifiable. An incision in the posterior superior wall of the auditory canal is far superior to Wilde's incision as a depleting measure. All cases of chronic otitis media purulenta resulting in mastoiditis should be operated on at the first appearance of symptoms without resorting to palliative measures. We are justified in opening the antrum for drainage in cases of purulent otitis media of long standing without symptoms of mastoiditis."

CLEMENS.

41. A paper on this subject was read by SPENCER at a meeting of the Royal Medical and Chirurgical Society on Tuesday, April 23d. In twenty recorded cases, death resulted from ulceration into the internal carotid. Reference was made to three cases in which arrest of hemorrhage was obtained by ligature of the common carotid. His own case, which he related, was that of a boy, aged four years, who had recently had scarlet fever and who had had a severe hemorrhage from the ear, nose, and mouth. Arterial blood was dropping from the left ear and nose on admission to the hospital. The nose, ear, and naso-pharynx were plugged. A severe hemorrhage occurred, rendering the child almost pulseless at the wrist, and unconscious. The left common carotid was

ligatured low down in the neck, and saline fluid infused into the cellular tissue of each axilla and flank. The hemorrhage ceased, and three weeks later a small healing perforation was seen in the upper and anterior quadrant of the membrane. He thought that the bleeding occurred from the twig given off by the internal carotid to the tympanum. ARTHUR CHEATLE.

42. The patient, a girl aged fourteen, while in the second week of scarlet fever, developed acute otitis media in both ears, which was followed by a free discharge. A few days afterwards the child had difficulty in swallowing fluids, but there was no nasal regurgitation. The characteristic appearances of facial paralysis developed on the left side, but it was not noticed whether the same condition existed on the right side from the beginning. The marked drawing of the face was not noticed until later, and it was then due to a partial recovery on the left side. The diplegia was more decided and apparent in the upper part of the face. The malleus and incus on the right side, and the malleus on the left, were destroyed. Deafness in both ears was due to involvement of conduction rather than to perception. The diagnosis offers no difficulties. The exact location, however, of the lesions is more difficult and must be determined, as in unilateral palsy, by the presence or absence of taste on the tongue, the amount of salivary secretion, the condition of hearing, etc. CLEMENS.

43. A study of these reported cases shows that when the Wilde's incision was employed it neither stopped the otorrhœa nor prevented subsequent attacks of mastoiditis, that the breaking down of the posterior wall of the canal and cleaning out the middle-ear cavity is a procedure almost sure to materially affect the hearing, and that healing is slower than when the usual method of operation is employed. CLEMENS.

44. CASE I.—The patient, male, aged twenty-one, had purulent discharge from the right ear for seven years, associated during the past two years with acute exacerbations. Temperature fluctuated between 100° and 105°, and finally there developed a distinct rigor. The drum was totally destroyed, and the upper wall of the canal was red, tender, and bulging. No swelling, pain, or tenderness on the mastoid. Although an operation was determined upon, before it could be executed a severe pain in the head occurred, with a rise of temperature to 103.6°. The patient rapidly became comatose. The mastoid was, nevertheless, opened, but no pus was found until the antrum was reached. A sinus in the

tegmen tympani was found, and upon enlarging it several drachms of pus escaped from the middle cerebral cavity. Death from leptomeningitis followed.

CASE 2.—The patient, male, aged twenty-one, was in the third week of typhoid fever when first seen. Pain and tenderness over the mastoid, and severe earache for past two days. Drum, which was red and bulging, ruptured during the examination, discharging bloody serum. No typhoid bacilli were found in cultures made from the discharge. Comfort followed, and profuse purulent discharge persisted for two weeks. A month later pain returned over the mastoid, and the upper wall of the canal was bulging to such an extent as to obscure nearly the entire drum. The mastoid operation only showed pus in the mastoid antrum.

The point emphasized in these cases is : that swelling is not a safe indication for operation, for it may be absent in chronic cases, and it may not occur in acute cases until perforation of the cranial cavity has taken place. CLEMENS.

45. A detailed report on seventy-five mastoid operations occurring in seven years in Zaufal's clinic. In all cases where the so-called teat-shaped perforation or perforating granulations formed in the drum, complications were present twice as pachymeningitis externa and twice as Bezold's mastoiditis ; the corticalis was unchanged. This appearance may be regarded as an indication of unusual resistance or thickness of the mastoid cortex.

Bezold's mastoiditis occurred 9 times ; of these, 3 succumbed to meningitis, 4 were healed by operation in twenty to forty-eight days, and 2 disappeared from view.

Changes in the eye grounds were observed 12 times ; venous hyperæmia, dilatation and tortuosity of vessels, ill-defined papillary margins, and probable retrobulbar neuritis once. In these 12, intracranial changes were found in 9.

The practice of paracentesis, performed 12 times in 9 patients, was in no instance favorable, and the mastoid had to be opened. Complications of acute otitis are due to the virulence of the inflammatory agent or to especially unfavorable anatomical conditions. No advantage is obtained from Wilde's incision ; in fact, recovery may be prolonged and the restoration of hearing is not so certain.

Slight rises of temperature are important in the estimation of indications for operation. A case of otitic pyæmia without sinus phlebitis was observed.

In recent years a part of the posterior wall was removed to facilitate closure of the wound cavity. In 40 cases of mastoiditis, the cavity communicated 23 times with the posterior cranial fossa. In removing diseased bone, the middle cranial cavity was exposed 9 times, the posterior 10 times, and both fossæ 6 times. In 19 patients, the middle fossa was exposed exploratively 4 times, the posterior 7 times, both 8 times. In 3 of these 19 patients, exploratory opening led to the discovery of an intracranial complication.

Most of the complications occurred in the posterior fossa, *i. e.*, 40 times, while only in 4 in the middle. Sinus thrombosis was present in 5 cases, 2 benign, and 3 infectious.

After operation, the horizontal incision is closed with sutures, and the vertical down to the lowest part, to admit an iodoform wick. The wound is only left open in brain abscess, injury to the sinus, broken-down sinus thrombosis.

Healing took place in 87¾ per cent. In partial suture of the wound, the course of healing took 15½ days. There were 6 deaths, 4 from meningitis, 1 septic from sinus thrombosis and meningitis, and 1 from uræmia. Three of the fatal cases are described in detail. In the first two cases of meningitis the infection was hematogenous, in the third, the meningitis followed purulent inflammation of the labyrinth extending through the aqueductus vestibuli. DENKER.

46. Description of a case where the mastoid was infiltrated with pus and broken down. The sinus was accidentally injured in removing a bone spicule. Recovery took place. RIMINI.

47. Hemorrhage occurred from the left ear of a boy, two and a half years old, suffering from acute otitis media, eight days after paracentesis had been performed, and in spite of gauze packing and ergot internally continued for eight days. Another case is cited of bleeding from an ear polyp which was made to cease with great difficulty. Attention is drawn to hemorrhage from the carotid or internal jugular after paracentesis. DENKER.

48. KATZ mentions in a supplement to his paper the publications of Bezold and Grünwald. His excrescences of the drum differ from the perforating aural polypi of these authors in the following manner: 1. No perforation with heavy inflammation and a resisting drum. 2. Growing in of the epidermis of the drum and formation of a canal. 3. Granulations from impeded discharge on the inner surface of the drum. 4. Hernial-like elevation of the drum, *i. e.*, of its epidermis. DENKER.

b.—CHRONIC OTITIS MEDIA.

49. **Champanx.** Treatment of otorrhœa at the seashore. *Arch. internat. de laryng., d'otol.*, vol. xiv., p. 1.

50. **Ferreri.** The diagnosis of tuberculosis in chronic purulent otitis. *Arch. ital. di otologia*, vol. x., p. 2.

51. **Zeroni.** A case of carotid hemorrhage following caries of the temporal bone. *Arch. f. Ohrenheilk.*, vol. li., p. 97.

50. FERRERI emphasizes the importance of recognizing the specific nature of a chronic otorrhœa, as intratympanic surgery in presence of a tubercular suppuration is not without danger. If the clinical and bacteriologic examinations are negative, the author inserts dermatol-glycerin gauze in the canal. If the part which was in the middle ear turns black, tubercular otitis is presumably present. In cases of tubercular disease without caries, tuberculin injection should be tried. RIMINI.

51. One week after a complete operation on a man with pulmonary phthisis, at the second dressing a profuse propulsive hemorrhage occurred from the depth of the wound, which was checked by packing. Two days later, another hemorrhage followed defecation, which was again checked by packing and compression of carotid. The patient went into collapse and died. At autopsy it was seen that the hemorrhage occurred through an opening of the tuberculously softened carotid wall with carious destruction of the carotid canal. The defect was at the usual site, namely, at the convex curve of the artery from the vertical to the central course. ZERONI recommends, in carotid bleeding following caries of the temporal bone, packing the external canal, ligature of the carotid, radical operation, and packing directly at the ulcerated part of the carotid. DENKER.

c.—CEREBRAL COMPLICATIONS.

52. **Hammerschlag.** Otitic brain abscess. *Monatschr. f. Ohrenhlk.*, No. 1, 1901.

53. **Denker.** Otitic brain abscess, extradural and subperiosteal abscess in the temporal region healed by operation. *Deutsch. med. Wochenschr.*, No. 2, 1901.

54. **Stenger.** Otitic brain abscess. *Berl. klin. Wochenschr.*, No. 11, 1901.

55. **Taptas.** A case of perisinuous abscess consecutive to an acute purulent otitis after complete healing of the otitis. *Ann. des mal. de l'or., du lar.*, Feb., 1901.

56. **Panse.** Two cases of involvement of the sinus after mastoid operation. *Arch. f. Ohrenhlk.*, vol. li., 1.

57. **Jack, Frederick L.** Two cases of ligature of the internal jugular vein for infective thrombosis of the sigmoid sinus due to purulent otitis media; one recovery and one death. *Boston Med. and Surg. Jour.*, Feb. 28, 1901.

58. **Koller, Carl.** Case of thrombo-phlebitis of the left sigmoid sinus masking a latent brain abscess in the temporo-sphenoidal lobe, both arising from chronic otitis media. *New York Med. Jour.*, Jan. 19, 1901.

59. **Waterhouse, H. F.** A case of lateral sinus pyæmia and cerebellar abscess. Recovery. *Brit. Med. Jour.*, March 30, 1901.

52. HAMMERSCHLAG reports two cases of otitic brain abscess, of which one recovered. The data collected by Röpke concerning brain abscesses, up to 1898, are completed by the author to 1900. Thus 195 brain abscesses, diagnosticated during life and operated on, are collected.

In one quarter the abscess followed an acute otitis, in three quarters a chronic otitis.

In the uncomplicated abscess, a rise of temperature occurred in more than one half. Rigors were seldom observed.

Tenderness in the temporal region was present 14 times; localized headache in 28.

Of 24 cases of unconsciousness and coma, 13 were cured.

96 abscesses of the left temporal lobe were associated with aphasia in 53.

Motor disturbances in the crossed extremities were frequently present (70 cases).

Of 106 operated on from the squama 32 (37.7 %), of 64 operated on from the mastoid 31 (48.4 %), and of 10 operated on from both places 8 (80 %) were healed. KILLIAN.

53. A girl, aged seven, who had suffered for a long time from otorrhœa, was taken ill with symptoms (severe headache, uncertain gait, vomiting, one-sided mydriasis, and slight neuritis optica) suggestive of an otitic abscess in the temporal lobe. At the operation, no communication with the cranial cavity was found; the middle fossa was then laid bare in the squama over the tegmen. The dura was discolored and covered with granulations. An abscess was located in the temporal lobe with the aspirating needle, the opening enlarged, and 70–80 *ccm* fetid pus evacuated. Recovery uneventful. This case shows that the optic neuritis need not always be bilateral. NOLTENIUS.

54. A girl, thirteen years old, with chronic otorrhœa, was operated on according to the radical method, on account of symptoms of retention. Signs of an intracranial complication (amnesic aphasia) intervened, and choked disc five days later.

The tegmen tympani was removed, and an abscess in the temporal lobe evacuated. A beginning cerebral hernia diminished after lumbar puncture. Recovery. **Brühl.**

55. **Taptas** reports the case of a girl, nineteen years old, where a paracentesis had been done for an otitis and the patient did not return for 2½ months. The drum had healed, the hearing was normal, but there was severe pain behind the right ear, with loss of appetite and insomnia. This was followed by œdema over the mastoid and glandular swelling. At the operation, a carious area was found in the posterior wall of the mastoid, leading to a subdural abscess. The bone otherwise was sclerosed, but healthy. The dura and sinus were covered with dark granulations. Recovery. **Zimmermann.**

56. In the first case, a healthy sinus had been exposed ; purulent phlebitis set in, caused, according to **Panse**, from infection of suppurating mastoid wound. The patient succumbed to pyæmia and pulmonary metastases. The author warns against closing wounds where the sinus is exposed.

In another case of sinus disease, which recovered, the patient was in good condition, normal temperature, but the pulse was rapid, irregular, and hardly countable, while Grunert claims that strength and regularity of the pulse in sinus disease is a sure prognostic sign. **Denker.**

57. Notwithstanding the favorable termination of cases where the removal of septic clots was successfully accomplished without ligation of the jugular vein, it is shown by the report of these cases that the weight of evidence is in favor of early ligation. If ligation of the internal jugular vein is performed before general septic invasion occurs, the chances of recovery are good ; if, however, a general septic condition has already developed, recovery is improbable. The conclusions of the writer are as follows : " In acute cases, before ligating the vein remove the purulent material in the sinus until a healthy clot is reached. After this operation, if rigors and elevation of temperature recur immediately, ligate the jugular vein and remove the entire thrombus above and below until a free flow of blood takes place. If at the original operation no healthy clot is found, ligate immediately. In chronic cases, no time should be lost in ligating the vein and completely removing the thrombus." **Clemens.**

58. The patient was a child, eight (8) years of age, who had chronic otitis media, with an occasional discharge from the left

ear. When first seen by the writer the child showed symptoms of mastoid disease, infective sinus phlebitis, and systemic infection, although there was no perforation or other pathological changes of the membrana tympani present. There was an optic neuritis of low degree. The case is reported principally to show that, when sinus-phlebitis is complicated with either an abscess of the temporo-sphenoidal lobe or meningitis, the symptoms of sinus-phlebitis not only completely mask those of the brain abscess, but partly those of meningitis as well.

The abscess in this case was of long standing, and communicated with the middle ear through a fistulous opening in the tegmen tympani. There was no indication shown at the autopsy that the abscess was caused by the sinus-phlebitis.

CLEMENS.

59. The patient was shown at a meeting of the Medical Society of London, held on March 25, 1901. As in many cases of cerebellar abscess, the patient ceased breathing under the anæsthetic, necessitating artificial respiration. ARTHUR CHEATLE.

NERVOUS APPARATUS.

60. **Stein.** Certain disturbances of equilibrium in labyrinthine disease. *Medicinskoje Obosvenie*, Dec., 1900.

61. **Gradenigo.** Labyrinthitis in mumps. *Arch. ital. di otol.*, vol. xi., 1.

61. GRADENIGO describes two cases of labyrinth affection after parotitis, in a boy of six and a soldier of twenty-one. In the first, five days after the parotid swelling, total bilateral deafness set in, which remained stationary, notwithstanding intramuscular pilocarpine injections. In the second case, ten to twelve days after the parotitis, the left labyrinth became involved with deep subjective noises and deafness. The termination is not stated.

RIMINI.

NOSE AND NASO-PHARYNX.

a.—GENERAL PATHOLOGY.

62. **Hofmann.** An unusual anomaly of the lateral nasal wall. *Monatschr. f. Ohrenhlk.*, No. 12, 1900.

63. **Chausserie-Laprée.** The early purulent rhinitis of scarlet fever. *Revue mens. des mal. de l'enfance*, vol. xiv., Feb., 1901.

64. **Cordes.** Hyperplasia and polypoid degeneration of the middle turbinal; nasal polypi and their relation to the bony parts of the ethmoid. *Arch. f. Laryng.*, xi., pp. 280–335.

65. **Sundholm.** On bone cysts in the middle turbinal. *Arch. f. Laryngol.*, xi.

66. **Renshaw, Knowles.** Nasal tuberculosis. *The Journal of Pathology and Bacteriology*, Feb., 1901.

67. **Morris, Malcolm, and Dore, S. Ernest.** Remarks on Finsen's light treatment of lupus and rodent ulcer. *Brit. Med. Jour.*, Feb. 9, 1901.

68. **Walsham, W. J.** A case of destruction of the nose, caused by a ferret. *Proc. Laryng. Soc.*, London, April 12, 1901.

69. **Parker, Charles A.** Notes on acquired syphilis of the nose and pharynx. *Lancet*, Jan. 26, 1901.

70. **De Blois, Thomas Amory.** Fractures of the nose. *N. Y. Med. Journ.*, Oct. 27, 1900.

71. **Cobb, Carolus M.** The purulent rhinitis of children as a source of infection in cervical adenitis. *Boston Med. & Surg. Journ.*, Jan. 10, 1901.

72. **Douglass, Beaman.** Emphysema of the eyelid from nasal causes. *N. Y. Med. Journ.*, March 25, 1901.

73. **Kyle, D. Braden.** A peculiar case of migratory foreign body with X-ray illustrations. *N. Y. Med. Journ.*, Jan. 19, 1901.

74. **Birkett, H. S.** Two cases of dermoid cyst of the nose. *N. Y. Med. Journ.*, Jan. 19, 1901.

62. Description of an accessory turbinal in the superior nasal meatus. KILLIAN.

63. CHAUSSERIE-LAPRÉE finds that the purulent coryza of scarlet-fever patients is the most frequent cause of death in this disease. The symptoms and treatment are discussed; importance is attached to prophylactic nasal irrigations performed with a Nelaton's catheter. The chief complications of scarlatinous coryza are empyema of the accessory cavities, otitis, suppuration of the cervical glands, broncho-pneumonia, purulent conjunctivitis; the obliteration of the nasal cavities in sucklings may be directly injurious to life. SCHWENDT.

64. The author describes twenty-seven cases in their clinical course and histological findings derived from the resected middle turbinal. 1. Hyperplastic middle turbinals with superficial inflammation of the mucous membrane (cases 1–4). 2. Hyperplastic middle turbinals, with inflammatory and polypoid degenerated mucous membrane (cases 5–11). 3. Polypi of the middle turbinal without manifest inflammatory bony changes (case 12). 4. Hyperplastic middle turbinal with extension of the inflammation to the periosteum and medulla (cases 14–15). 5. Polypoid formation of the middle turbinal (ethmoid labyrinth), with ostitis but without purulent disease of an accessory sinus (cases 15–21). 6. The same changes, but with involvement of the accessory

sinuses (cases 22–25). 7. Transposition of an ethmoid cell in the middle turbinal (cystic formation, case 26). 8. Empyema of an ethmoid cell located in the middle turbinal, ostitis and polypoid degeneration. The author draws the following conclusions:

Hyperplasia, polypoid degeneration, and some cases of polypoid formation of the nasal mucous membrane are produced by the same inflammatory process of the mucous membrane. The latter forms are but another manifestation of the same inflammatory process which in certain cases leads to serous exudation. Inflammation of the mucous membrane leads to hyperplasia of the bone from increased vascularization. The so-called mucous polypi are the result of an inflammatory serous exudate in the mucous membrane. In polypoid formation, the disease in the simple cases is located in the mucous membrane; in the multiple or relapsing cases, the bone is always involved. There may be a simple infiltration of the periosteum and medulla of the bone, but a chronic proliferating periostitis and osteoplastic otitis are the most frequent. The bone may be involved primarily (typhoid, scarlet fever, influenza, acute exanthem) or secondarily to the mucous membrane of the nose or the accessory cavities. The course and treatment of the disease depend upon the localization of the morbid process. If the mucous membrane only be affected, the removal of the polyp and diseased mucous membrane suffices. If the bone is also involved, the ethmoid labyrinth must be removed according to the extent of involvement. Disease of the bone is probable when after removal the polypi continue to recur. In certain cases the bone process may heal of itself, though the mucous polyp may persist. These are the cases of multiple polypi; simple removal proves effectual. Polypi are not pathognomonic for empyema of the accessory sinuses, as the latter develop more frequently from other causes. The empyemata are frequently the cause of polyp formation from inflammatory extension to the bone. ZARNIKO.

65. Three cases of bone cysts of the middle turbinal with microscopic examination. These cysts are unusually well-developed ethmoid cells. ZARNIKO.

66. RENSHAW, after dealing with the history of the subject, describes the results of inoculating tuberculous sputum into the superior nasal fossa of guinea-pigs. Eight pigs were inoculated.

After describing the effects, he summarizes as follows: 1. Primary tuberculosis of the nasal mucous membrane does occur in man, and not so infrequently as is generally supposed. 2. The simple introduction of the bacilli into the nostril of a susceptible animal without any abrasion may cause tuberculous infection. 3. Infection having occurred, the disease tends to run a slow course. 4. Probably the farther from the entrance of the nostril the seat of the lesion, the more rapid the course of the disease, and the earlier the invasion of other organs. 5. The system is, as a rule, invaded by means of lymphatics, though very occasionally by other routes. ARTHUR CHEATLE.

67. The technic, etc., of the treatment are given and a good result in lupus vulgaris of the nose is recorded.
ARTHUR CHEATLE.

68. The patient, aged twenty-four years, was attacked by a ferret at the age of three months. The whole of the nose, part of the skin of the forehead, and a large part of the middle of the upper lip was destroyed. Eighteen plastic operations had been performed. ARTHUR CHEATLE.

69. This paper is a comprehensive and useful one and is based on PARKER's observations at the Throat Hospital, Golden Square. The disease is dealt with in its three stages and stress is laid on such signs and symptoms as should lead to prompt recognition. He insists on mercurial inunction combined with iodides internally in rebellious cases. ARTHUR CHEATLE.

70. The injury may involve the two small nasal bones alone, or more severely the nasal process of the superior maxillary or the zygomatic arch of the malar bone. It may occur during parturition, nursing or sleep of infants, later most frequently by falling, running into objects or blows, and during manhood mostly by sparring. The reduction is not difficult, if the injury is recent and the reduced parts are held in place by internal and external splints. M. TOEPLITZ.

71. As a type of cases, in which purulent nasal discharge is the cause of cervical adenitis, COBB cites that of a child, without any history of previous trouble with the nose or throat, contracting diphtheria at the age of two years, which is followed by purulent discharge. Two years later, enlarged tonsils and adenoids are removed, and one year after the operation she still has a purulent discharge from the nose and a cervical adenitis following an acute coryza. Cobb claims that the source of infection, which causes cervical adenitis, is in close proximity to the glands involved, viz. the mouth, throat, nose, or ear; only in a small percentage of

cases systemic infection is at fault. Purulent diseases of the nasal cavities are the source of infection, acute infectious diseases being the exciting cause. M. Toeplitz.

72. The accident occurs either after a trauma, also after operation, through a pre-existing opening between the orbit or ethmoid cells, or an by injury to the lachrymal duct through operation or disease, after the nose has been forcibly blown. In the four cases reported by Douglass, it was observed in two after operations on the ethmoid cells, in the other two without it, after simple blowing. In the ethmoid cases, the lamina papyracea may be perforated, and it is, therefore, advisable to open the cells before or without removing the protecting middle turbinate. The filling of the upper lid with air in ethmoid cases is due to the fact that the wall of the orbit is perforated near the middle and that the air enters the space between the orbital periosteum and the first fascia of the eyeball, the layer above the extrinsic muscles.

M. Toeplitz.

73. The first attack, during the latter part of January, 1887, lasted. nine weeks. There was a sensation of something crawling underneath the scalp, that seemed to extend from the back of the neck forward over the top of the head, followed by considerable swelling and severe pain. Repeated milder attacks occurred until 1890. The swelling and sensations travelled forward with each attack, and tenderness over the mastoid became quite pronounced. In December, 1898, the peculiar sensation had reached the forehead, with considerable external swelling and profuse discharge of pus from the nostrils. Whereupon, in freeing the nostril by rather forcible blowing, about half an oxidized needle was found in the handkerchief. Kyle, on August 23, 1899, found a swelling on the right side of the face, extending to the antrum Highmori, the orbit, and the base of the nose. An X-ray picture revealed the presence of a foreign body, but nothing determined its exact location. A few days after an exploratory opening, about a quarter of an inch back of it, a needle projected from a ruptured swelling, and was withdrawn. How the needle entered, nobody knows. M. Toeplitz.

74. Case 1.—A young man, æt. sixteen, with a "discharging sore" near the tip of the nose in the middle line, which repeatedly burst, closed, and reappeared. A small circular opening, 2 *mm.* wide in the middle line and about 5 *mm.* from the tip, showed by skiagram a fine dark line, leading from the centre of the opening

directly upward and backward into the septum. This sinus was lined by dense fibrous membrane and covered with sebaceous material. At the distal end several fine hairs were found. Good result after dissection of the cicatrix. CASE 2.—In a boy, æt. eight, a tumor, existing since birth, had gradually increased and is now oval, occupying the greater portion of the bridge of the nose, extending from one quarter of an inch above a line drawn horizontally from the eyebrow on the one side to that of the other and continuing downward for an inch, reaching about the centre of the nose. At the upper portion it is broader and gradually narrows below, assuming thus somewhat the shape of a pear. At the lower point a few fine hairs were noticed. In length it measured 1¼ inches, in breadth, at the widest part one half inch. A third case was observed in a girl, nine months old, presenting at birth a tumor, of the size of a small pea, in the middle line and near the tip of the nose. Six additional cases are found in literature, and seven photographs and a skiagram illustrate the paper.

M. TOEPLITZ.

b.—METHODS OF TREATMENT.

75. **Struyken.** Nasal tamponades. *Arch. internat. de laryng., d'otol.,* etc., vol. xiv., No. 1.

76. **Lichtwitz.** Apparatus for the hot-air treatment of the nasal cavities. *Arch. internat. de laryng., d'otol.,* etc., vol. xiv., No. 1.

77. **Hamon du Fougeray.** Chromic acid in 50 per cent. solution in the treatment of malignant tumors of the pharyngeal, nasal, and laryngeal mucous membrane. *Ann. des mal. de l'or., du lar.,* Jan., 1901.

75. The author recommends for packing the nose a sterilized finger cover which is filled with gauze soaked in vaselin when in position. SCHWENDT.

76. The receptacle for compressed air is expensive and the transportation by rail is slow. LICHTWITZ recommends an electro-motor of 120 volts for charging. SCHWENDT.

77. FOUGERAY obtained good results from chromic acid in three cases of malignant disease. The first, a woman of thirty-eight, with an ulcerative infiltration of the soft palate, which remained healed after scraping and chromic-acid applications for at least two years. A similar case, in a woman of fifty, was in process of recovery when the patient died of bronchitis. In the third case, the dyspnœa caused by a larynx tumor was temporarily relieved. ZIMMERMANN.

c.—SEPTUM.

78. **Boenninghaus.** Resection of the cartilaginous and bony septum in marked deflection. *Arch. f. Laryng.*, xi.

79. **Kreilsheimer.** The after-treatment of operations for nasal spurs. *Arch. f. Laryng.*, xi.

78. In most cases, according to the author, Krieg's resection cannot be dispensed with. The mucous membrane on the convex side need not be preserved. The portion of the septum to be resected should rather be too large than too small. The length of operation (½ to 1 hour) is justified by the result obtained.

ZARNIKO.

79. KREILSHEIMER, to avoid the unpleasant packing, recommends that the wound edges be touched with glowing galvanocautery after operation and xeroform applied. (The reviewer begs to point out that after a properly performed operation packing may be dispensed with except in very few cases where the blood-vessels spurt.) ZARNIKO.

d.—NEW GROWTHS.

80. **Schwendt.** Malignant tumors of the accessory nasal sinuses. *Arch. f. Laryng.*, xi., 3.

81. **Ferreri.** Tumor of the sphenoidal sinus. *Ann. des mal. de l'or., du lar.*, Jan., 1901.

82. **Lack, H. Lambert, and Baber, Cresswell.** The treatment of nasal polypus. *Proc. Laryng. Soc.*, London, Dec. 7, 1900.

83. **Wright, Jonathan.** The non-myxomatous character of nasal polypi. *N. Y. Med. Rec.*, Jan. 26, 1901.

84. **Ball, J. B.** Endothelioma of the nose. *Med. Press*, March 13, 1901.

85. **Wagner, Henry Lewis.** Angeioma cysticum of the nose. *N. Y. Med. Journ.*, March 16, 1901.

80. A report of ten cases belonging to Prof. Kümmel in Breslau. 1. Carcinoma of the maxillary antrum; empyema. Perforation in cheek. Tumor at first not recognized. Resection of sup. maxilla. Healed, early recurrence. 2. Epithelioma of the maxillary antrum. Empyema of the maxillary and frontal sinus. Partial resection of sup. maxilla. Early recurrence. 3. Round-celled sarcoma originating in ethmoid. Empyema of the ethmoid cells; perforation into orbit. Mental disturbances. Incomplete operation. Death. Tumor had invaded both frontal lobes. 4. Spindle-celled sarcoma arising from the anterior ethmoid cells. Intranasal removal. No recurrence after six months. 5. Hard papilloma arising from the anterior ethmoid cells.

Intranasal removal. Empyema of the frontal sinus. 6. Fibrosarcoma of the anterior ethmoid region. Empyema of the right maxillary antrum. After repeated intranasal removal of the growth, radical operation attempted. Death from meningitis. 7. Carcinoma of the posterior ethmoid cells. Early ocular symptoms. Exophthalmos; diplopia. Epistaxis. Intranasal removal. Later psychic disturbance. 8. Small round-celled sarcoma, originating in ethmoid. Epistaxis. Incomplete intranasal removal. Recurrence. Exophthalmos. Blindness. Incomplete extirpation with resection of the external nose. Dura exposed. Temporarily healed. 9. Soft papilloma of the roof of the nasal cavities, extending to the perpendicular plate. Intranasal removal. Recurrence after months. 10. Carcinoma of the sphenoid cavity. First symptom, otalgia. Slow growth in 9 months. The paper concludes with description of the symptoms, especially those dependent on the localization of the tumor. ZARNIKO.

81. A very complete history of a woman of sixty who had a hard tumor in the naso-pharynx, arising from the roof, and of slow growth. Attempts at removal were unsuccessful. The patient died of apoplexy and at autopsy it was seen that the growth originated in the sphenoid sinus and had extended into the cranial cavity. ZIMMERMANN.

82. An interesting and instructive discussion, of which it is impossible to give an abstract. Dr. LACK illustrated his paper by a series of diseased middle turbinate bodies, showing the transition stage between simple œdema and true polypus, and by a series of microscopic slides of sections of the bone underlying polypi showing various degrees of periostitis and osteitis.

ARTHUR CHEATLE.

83. WRIGHT proves that the histological character of mucous polypi is not myxomatous, but œdematous. This mistake has caused a halt in the understanding of the pathological processes in the nose. M. TOEPLITZ.

84. The case was reported by BALL at a meeting of the West London Medico-Chirurgical Society, held on March 1, 1901. A young woman had a small growth removed from the inside of the ala nasi. Shattock reported that it was a connective-tissue or endothelial growth arising from lymphatic endothelium.

ARTHUR CHEATLE.

85. The tumors were found in the noses of a boy nine years

old and of a woman twenty-eight years old, respectively, obstructing the entire posterior portion of one side of the nose, and protruding somewhat into the naso-pharyngeal cavity. They were quite elastic, movable, and attached to a small base below the foramen spheno-palatinum ; contained a brownish fluid with large quantities of serum-albumin and, microscopically, in the cyst wall, principally venous vessels and cavernous sinuses, as illustrated by the accompanying cut. M. TOEPLITZ.

e.—ACCESSORY CAVITIES.

86. **Avellis.** The ulcer of the mucous membrane in acuta empyema of the accessory cavities. *Arch. f. Laryng.*, xi.

87. **Onodi.** Relation of the maxillary antrum to the sphenoid cavity and to the anterior ethmoid cells. *Ibid.*, xi.

88. **Furst.** Opening of the two sphenoidal cavities across a healthy maxillary antrum. *Arch. internat. de laryng., d'otol.*, etc., vol. xiv., No. 1.

89. **De Carli, Deodato.** Three cases of inflammation of the frontal sinuses. *Arch. ital. di otol.*, vol. x., No. 3.

90. **Cryer, M. H.** Modes of infection of the maxillary sinus. *Jour. Amer. Med. Assoc.*, Nov. 24, 1900.

91. **Douglass, Beaman.** The pneumatic sinuses in the sphenoidal wings. *The Laryngoscope*, Feb., 1901.

92. **Hamilton, W. D.** Growths in the frontal sinus. *Jour. Amer. Med. Assoc.*, Jan. 26, 1901.

93. **Grant, Dundas.** Case of alveolar epithelioma of the ethmoidal cells and antrum. *Proc. Laryng. Soc.*, London, Nov. 2, 1900.

86. It has always been thought that acute empyema of the accessory cavities does not heal, because of impeded outflow of the discharge. AVELLIS gives another cause. There are acute cases of accessory-sinus disease where the bone is exposed, superficially necrotic, and covered with granulations. These cases are peculiar, owing to a great increase in the pain, and do not heal after the usual nasal treatment. The customary trephining with free drainage suffices, so that an obliteration of the cavity, as in chronic cases with mucous ulcer and granulations, is unnecessary, and the disfigurement of the patient can be spared.

ZARNIKO.

87. The author has found that the maxillary antrum, as well as the sphenoid sinus, may send prolongations into the other, and the cavities need only be separated by a thin wall. The posterior ethmoid cells directly adjoin the maxillary antrum to a large extent, and occasionally there is a direct communication between an anterior ethmoid cell and the antrum of Highmore.

The clinical importance of these conditions is emphasized (transmission of infection, possibility of resecting the ethmoid and sphenoid from the antrum [Jansen]). ZARNIKO.

88. The suppuration of the sphenoid cavities is diagnosed after removal of the middle turbinal. The healthy left antrum of Highmore is opened through the canine fossa and access is made to the choana through the inner wall. The lower wall of the sphenoid cavity was chiselled away, an opening made through the median wall, exposing the other sphenoid cavity. Gauze packing was introduced through the nose; the opening into the antrum was closed by suturing the mucous membrane. Healing in fourteen days. This method is recommended when the nose is narrow, the antrum is also affected, and extension to the brain is feared.

SCHWENDT.

89. The first two patients were syphilitic and suffered from an inflammation of the frontal sinus (pain in the forehead, superorbital swelling). In the one, antisyphilitic remedies were of no avail, the sinus was trephined, and the discharge ceased in two months. In the other, both frontal sinuses were involved; the anterior walls had been destroyed, so that irrigation was possible. Antisyphilitic and local treatment led to a cure. In the third case operation was refused, so intranasal treatment was instituted.

RIMINI.

90. CRYER first dwells upon the development of Highmore's antrum, and then demonstrates by twelve excellent illustrations, continuing those shown in previous papers, how great the variations may be in the nasal chamber, the maxillary, frontal, and sphenoidal sinus, as well as in the cells of the orbital process of the palate bone and the ethmoidal cells. Infection is usually conveyed through the common communication with the other accessory sinuses to the antrum, and by resorption of bony partitions. Teeth are lost rather through disease of antrum than primarily diseased, causing infection of the antrum.

M. TOEPLITZ.

91. DOUGLASS investigated the relations of the pneumatic cavities in two hundred cases, and found that *a*, in 15.5 % the great sphenoidal sinus was entirely confined to the body, the small wings always containing pneumatic cells; *b*, in 3.5 % a sinus of the small wing communicated almost exclusively with the posterior ethmoidal cell; *c*, in 84.5 % the great sphenoid sinus extended into the small wings of the sphenoid; *d*, in 4.5 % the posterior

ethmoid cell extended slightly backward into the region of the sphenoidal wings. Examples of the sinuses of the sphenoidal wings are more minutely described, and nine illustrations accompany the paper. In conclusion, the practical bearing of these sinuses is dwelt upon. M. TOEPLITZ.

92. HAMILTON reports two cases of osteoma of the frontal sinus, the first in a man, aged thirty-six, who was struck on the forehead when fourteen years old. A swelling ensued on the root of the nose, from which, after incision, pus escaped, but which never entirely disappeared, and even increased. The forehead showed an enlargement, extending from the line of the brows above the frontal eminences and laterally to the angular processes, irregular in contour, measuring transversely 3½″, vertically 2½″. The osteoma could not be shelled out, and was removed piecemeal with saw, chisel, and rongeur forceps; it weighed 4½ ounces. Recovery. The second case occurred in a man, aged twenty-seven, who had noticed a protrusion at first three years before admission. It was directly above the nasal process of the frontal bone, of the size of a walnut, and flattened slightly from one side to the other. He also had double exophthalmus, especially of the left eye, with divergence, double optic neuritis, inability to read, and threatened blindness. L. retina striated and on nasal side patch of choroiditis. An osteoma of softer consistency was found in the frontal sinus, together with polypi and pus, which were in contact with the dura mater. The roofs of the orbits were destroyed. M. TOEPLITZ.

93. A woman aged fifty-three years was seen in October, 1900, on account of blocking the left nostril, loss of smell, with pain in the left nostril and cheek and swelling of the left cheek and in the orbit, pushing the left eye upwards and outwards.

The illness was of nine months' duration, and had commenced with symptoms of cold in the head and the formation of a polypus. A microscopical examination of removed tissue showed it to be alveolar epithelioma. The growth was removed by exposing the superior maxilla. The disease was found to have eaten away the anterior wall of the antrum and a large portion of the floor and inner wall of the orbit. The whole of the diseased tissue was scraped away from the ethmoidal cells, the lachrymal bone and os planum being almost completely removed. As the floor of the antrum was found to be free, the alveolar and palatal processes were left in position. ARTHUR CHEATLE.

f.—OTHER AFFECTIONS.

94. **Felix.** Lupus of the upper respiratory mucous membrane. *Ann. des mal. de l'or., du lar.*, Jan., 1901.

95. **Dietsch.** On the etiology of hay fever. *Deutsche med. Wochenschr.*, No. 7, 1901.

94. This is a careful compilation of the literature on lupus of the upper air passages and a description of twelve cases.

ZIMMERMANN.

95. The author, himself a sufferer from hay fever, does not regard this malady as an infectious disease, but caused by pollen. A predisposing factor is an irritability of the nervous system and probably an arthritic constitution. NOLTENIUS.

g.—NASO-PHARYNX.

96. **Botey.** Pseudo-hæmoptysis of naso-pharyngeal origin. *Ann. des mal. de l'or., du lar.*, Jan., 1901.

97. **Poljakow.** On latent tuberculosis of the pharyngeal tonsil in sucklings. *Dissert.*, St. Petersburg, 1900.

96. BOTEY published six cases to show that an hæmoptysis may be simulated by bleeding from the roof of the naso-pharynx. A chronic pharyngitis and rhinitis sicca were present in four of the cases; otherwise there was no anomaly. ZIMMERMANN.

97. POLJAKOW endeavors to answer the two following questions: 1. How frequent is latent tuberculosis of the pharyngeal tonsil in sucklings? 2. Is tuberculosis a factor in the etiology of adenoids? Fifty tonsils of children up to one year were examined. Conclusions: 1. Hyperplasia of the pharyngeal tonsil occurs in the earliest age. 2. The form of hyperplasia differs from that called adenoids; the tonsils are almond-shaped with furrows. 3. Tuberculosis is not an active factor; tuberculous changes were found in four out of the fifty tonsils, and the most enlarged tonsils showed neither in their own structure nor in the body elsewhere any tuberculous lesion. 4. In the tuberculous bodies, the tonsils showed changes in one third of the cases. 5. There was one case of undoubted primary tuberculosis of the pharyngeal tonsil. 6. In all cases of tubercular infection of the pharyngeal tonsil, the lesion was not apparent, hence latent in distinction to the ulcerous form. 7. In all tubercular tonsils, many tubercle bacilli were found. 8. The general condition of the body has very much to do in causing tonsillar hyperplasia; the largest tonsils are found in rhachitic and marasmic children. SACHER.

SOFT PALATE, PHARYNX, AND MOUTH.

98. **Strazza.** Retropharyngeal abscesses in sucklings. *Arch. ital. di otolog.*, vol. xi., No. 2.

99. **Mangubi.** On the function of the tonsils. *Wratsch*, No. 44, 1900.

100. **Kelly, A. Brown.** Sclerotic hyperplasia of the pharynx and nasopharynx. *Lancet*, April 6, 1901.

101. **Goodale, J. L.** Retropharyngeal abscess in the adult. *Boston Med. and Surg. Journ.*, Jan. 31, 1901.

102. **Chappell, Walter F.** Hemorrhage from a circumtonsillar abscess. *N. Y. Med. Journ.*, March 2, 1901.

103. **Lincoln, Rufus P.** Supplementary report on a recurrent tonsillar tumor. *N. Y. Med. Journ.*, Oct. 27, 1901.

104. **Koenig, Augustus.** Adhesion of the soft palate to the posterior wall of the pharynx. *Phila. Med. Journ.*, Feb. 16, 1901.

98. STRAZZA divides retropharyngeal abscesses into those which are situated behind the fibrous membrane forming the pharyngeal wall, extrapharyngeal, and those intrapharyngeal, in the wall itself. The extrapharyngeal occurs in adults after caries of the vertebræ; the intrapharyngeal in children, and especially sucklings. In the extrapharyngeal, the opening should be made externally anterior or posterior to the sterno-mastoid, whereby better drainage and direct treatment of the caries is possible. The intrapharyngeal in sucklings make the clinical appearances of the phlegmonous angina of adults. Strazza first opens the abscess through a curved trocar and enlarges the opening with a blunt-pointed knife. RIMINI.

99. MANGUBI removed the tonsils in dogs and let them inhale septic material; he also injected diphtheria toxin and cultures. The dogs suffered from diarrhœa and vomiting, while the control dogs remained healthy. After removal of the tonsils, the blood was altered: continuous hypobiocythosis, decrease in red blood corpuscles and hæmoglobin. SACHER.

100. KELLY bases his paper on one case, and claims to have described a hitherto undescribed pathological entity. A man aged thirty-four years has been subject to slight attacks of sore throat for about eight years. Three years before examination he began to feel something in the pharynx which he wished to expel. Latterly choking fits had been excited by "something" coming forward on the tongue or passing too far back. Nasal obstruction was also noticed. On examination, the uvula hung down like a curtain concealing the posterior pharyngeal wall, its length was over 1¼ inches, its width at the base 1 inch, and it was also

greatly thickened. The color was pale and the consistence fibrous, forming a firm, unyielding mass. On bringing the uvula forward, the posterior wall of the pharynx presented the following appearance: A narrow tract of apparently normal tissue ran down the middle of the posterior wall; on each side of this, extending outwards to the lateral wall, and incorporating with it a part of the right and the whole of the left posterior faucial pillar, was a broad, prominent band, which was thicker in its outer part. These bands passed upwards into the naso-pharynx and downwards to the top of the œsophagus. Their consistence was that of muscle, and they could be pushed en masse towards the mid line. Their color was gray and their surface smooth.

The lumen of the naso-pharynx was much reduced. A mass of thickening was present in the adenoid region, but was least marked in the centre. The greater part of the uvula was removed. Sections showed that the uvula consisted of dense connective tissue of sparsely cellular character and fibrillated in appearance; surrounding the majority of the vessels were dense areas of leucocytic infiltration. The surface epithelial cells had undergone a change comparable to that in the keratinous layer of the epidermis. A long microscopic report is given by A. R. Ferguson.

The bacteriological examination was negative.

Kelly concludes:

1. That the pharynx and naso-pharynx may be the seat of a sclerotic hyperplasia unconnected with syphilis, rhinoscleroma, or other known infective disease.

2. That a similar morbid process may manifest itself beneath the vocal cords as subglottic hypertrophic laryngitis.

3. That in the hyperplastic variety of hereditary syphilis the histological appearances closely resemble those of the described sclerotic hyperplasia. ARTHUR CHEATLE.

101. In a man, æt. eighteen, a swelling slowly developed in four weeks over the entire posterior pharyngeal wall, fluctuating and extending downward from the level of the soft palate, without fever. By incision about four ounces of pus were evacuated. A guinea-pig injected with a bouillon suspension of the pus died after seven weeks from tuberculosis. The pus contained tubercle bacilli. There was no evidence of disease of the cervical vertebræ. The patient recovered and remained in good health.

M. TOEPLITZ.

102. A man, æt. twenty-seven, had in two years two attacks of

quinsy. After the second, the internal and external swellings remained for five weeks, in spite of four incisions made, the abscess pointing in the middle of the posterior pillar of the soft palate, which, when opened, released one half ounce of foul pus. Four days later, a hemorrhage of six ounces, followed after four hours by another of eight ounces, and after five days by a third of eight ounces, which was controlled by a large incision through the anterior surface of the soft palate and backward to the abscess cavity, which was packed. The ascending pharyngeal artery was seen at the outer and rear wall of the cavity. Examination of the urine revealed the presence of nephritis. Two days after the last hemorrhage an attack of rheumatism set in. Recovery. M. TOEPLITZ.

103. LINCOLN'S patient, a male, æt. forty-five, had in 1897 been reported by Delavan for an ulceration of the much indurated left tonsil, which was removed and microscopically found to be syphilitic. A year later, Lincoln observed in the region of the left tonsil a non-ulcerated hard tumor occupying half of the pharyngeal space. After dissecting the pillars from the tumor the whole mass was enucleated and found to consist of granulomatous, syphilitic tissue, while another microscopist does not believe the evidence to be conclusive. There was no return of the tumor for eighteen months after removal. M. TOEPLITZ.

104. A man, æt. thirty-four, contracted an adhesion of the soft palate to the posterior pharyngeal wall, when eleven years old, through an ulcerated sore, lasting eight months and extending from the right side to one half inch of the left side, leaving scarcely room enough for the admission of a retractor. The parts were begun to be separated under cocaine with a pair of curved scissors and an instrument with the curve of a Gottstein curette and a double lateral cutting edge. A plug inserted by means of Bellocque's canula remained for forty-eight hours and was replaced by a hollow silver plug made to fit the cavity. Healing took place in three weeks. M. TOEPLITZ.

BOOK NOTICES.

IV.—**Transactions of the Otological Society of the United Kingdom.**

Vol. I. First Session, 1899–1900. (With list of Officers, addresses of Members, and Rules and Regulations.) Edited by CHARLES A. BALLANCE, M.S., F.R.C.S., and ARTHUR H. CHEATLE, F. R. C. S. London: J. & A. Churchill, 7 Great Marlborough St., 1900.

A well-gotten-up small octavo of seventy-four pages of text, nine illustrations (two in the text, seven on six plates of glazed paper), accompanying the articles, and an index of authors and subjects.

This little volume, the first annual report of the British Otological Society, contains a good deal of interesting and important reading matter, even after the extensive magnificent report of the unexcelled Sixth International Otological Congress, held the year before in London. The list of officers is: President, Sir Wm. Dalby. Vice-Presidents: U. Pritchard, Thos. Barr, Geo. Field. Secretaries: C. A. Ballance and A. H. Cheatle. Librarian: E. C. Baber. Treasurer: A. E. Cumberbatch. The Society, in its first year, consisted of sixty-two ordinary members and one honorary member (Adam Politzer, of Vienna).

The Rules and Regulations for the conduction of the Society are judiciously considered and carefully drawn up. We abstract the most important.

The election for membership is based on the following requisites on the part of the candidate: *a*. Contributions to otology. *b*. Special opportunities to advance otology. *c*. Professional eminence.

The Council (six members) has the power of electing men of distinguished eminence in otology as honorary members, whose number shall not exceed six. The Council has the power of filling any vacancies in the offices of the Society that may occur between the last and the next annual meeting.

The President and the Vice-Presidents shall not serve for more than two consecutive years.

The Secretaries shall be the Editors of the *Transactions* under the direction of the Council.

All papers shall be handed to the Secretaries immediately after having been read.

Each member taking part in any *discussion* shall write on a form, provided for the purpose, an abstract of his remarks, which shall be given to the Secretaries before the end of the meeting.

Every paper read before the Society shall be the exclusive property of the Society, and the author shall not be permitted to withdraw it, except by permission of the Council. If, in contravention of this rule, a paper read before the Society, be published elsewhere by the author, it shall thereby be disqualified for admission to the Society's Transactions.

An abstract of each communication, for publication in medical journals, shall be given to the Secretaries at the end of the meeting.

The Society holds four Ordinary Meetings, at 4 P.M., on the first Monday in December, February, March, and May, in London, or elsewhere, as the Council may decide.

The First Ordinary Meeting was held in London, Feb. 5, 1900. The presidential address was read by the Chairman, Sir William Dalby, of which the reviewer begs to mention some sentences. "I think what chiefly would be noticeable to a lay visitor of this assemblage of aural surgeons, would be the comparative youth (with a few exceptions) of the members. The reason is not far to seek. It is only of recent years that the progress of aural surgery has reached such a point as to attract young surgeons of good abilities and prospects to devote their lives to its practice. . . . Twenty-five years ago, only three or four of the London hospitals had aural surgeons on their staff. . . . The bulk of the ear patients went for treatment and cure to those surgeons that professed to treat and cure, and confined themselves to professing, for there was nothing beyond." This statement is too sweeping. It is quite true that twenty-five years ago there was no mastoidology, but there was, scientifically and practically, quite a respectable otology. The anatomy and physiology of the hearing organ, much older than twenty-five years, dates back to the great Italian and French investigators, and for the search of the men who were the founders of the clinic and pathology of ear disease Sir William need not look far about: he will find the best names in the United Kingdom (W. Wilde in Dublin, and two others, Toynbee and Hinton, in his own residence, on Saville Row, London). It is true that the great achievements of operative otology are of recent date and represent only a branch—one of the most intricate and difficult, indeed—of modern ear surgery, which owes its origin to the work of Lister, and its accuracy to the anatomical researches of Tröltsch, Schwartze, Politzer, etc., whereas its methods refer to Schwartze, Zaufal, Küster, Stacke, Horsley, Barker, Macewen, Ballance, and a great many others. The suppurative affections of the middle ear, their intracranial complications and vital consequences, occupy at the present day the centre of interest in otology, overshadowing by their practical importance, their extension, and their difficulty of treatment all other questions. The special aim of the aurist must be to preserve as much of the hearing power as is compatible with safety of life.

"On this intensely interesting question — Sir William says—we are now going through a crisis, a revolution in surgery," and he adds, when we are depressed by our failures, these consoling words: "Let us remember that in all revolutions, however righteous, some mistakes must be made, for the man that makes no mistakes achieves nothing."

After this discourse the papers and discussions follow. We need not here enter into abstracting them, for they have been made known to our readers by reports furnished by one of the Secretaries, Mr. A. Cheatle. The papers, as well as the discussions, are distinguished by their unusually practical contents and the concise and clear diction. The unsurpassed opportunities of observing and handling most important and varied cases of disease, and, on the part of the patients, their practical sense, national bravery, lack of nervousness, and their generally vigorous constitution, give the English surgeon a great advantage over his continental and transatlantic confrères. This statement may be verified on almost every page of the book before us. In the three meetings of last year there were thirty communications, more or less extensive, some very short, with demonstrations of illustrations and specimens, all instructive, and the majority of the communications, brought out in the discussion, were other similar observations confirmative of or sharply different from the results obtained by members as well informed and skilled as the speakers themselves. Good case-taking is a distinctive feature of English medical literature; to name an example familiar to all of us—the reports of cases in W. Macewen's book on *Infective Diseases of the Brain* are classical models; no essential feature is missing, and all irrelevant statements or remarks are omitted.

Every aurist will read the *Transactions of the Otological Society of the United Kingdom* with interest and profit. H. K.

V.—**Oreille et Hystérie.** With eighty-four diagrams in the text. By Dr. FLEURY-CHAVANNE. J. B. Baillière et Fils, Rue Hautefeuille 19, Paris, France. 1901. Price, frs. 7.50 ($1.50).

This monograph of 320 large-octavo pages is well printed on good paper, and deals exhaustively with a subject little known but of great practical impôrtance. The author has been induced to write this monograph, and he has been greatly assisted clinically, biographically, and critically by his teacher, professeur agrégé à la Faculté de Paris, Médecin des Hôpitaux. At first sight, the reviewer received the impression that the book was another of those long-winded literary productions—so common in continental Europe—in which a subject of restricted interest is given an inórdinate amount of space. The beginning of the book partially confirmed this suspicion by the detailed descriptions of all the methods of examining the hearing function—voice, watch, acoumeter, tuning-forks in all their varieties, galvanic reaction—which are contained in every modern text-book of otology, with the acquaintance of which the author might fairly have credited the reader. And yet, even this introduction may not be unwelcome to a number of aurists. The historical remarks, showing that the subject has long received considerable attention, are quite interesting. The second chapter division of the subject begins with this transcendental statement[1]: "From the foregoing exposition it follows that aural hysteria comprehends all the modes of reaction of the ear under the influence of the neurosis. As to the intimate nature of this reaction, it is that of hysteria itself, namely, one of those encroachments of the unconscious upon the conscious, which constitute the basis of the psychic process of hysteria" [*un de ces impiétements de l'inconscient sur le conscient, qui foment le fond du processus psychique de l'hystérie*]. This sentence is so imposing that it might have been written by the long defunct, celebrated German philosopher Hegel, whom a students' song so divinely ridicules. Apart from this, we can speak only commendingly of the book, which is divided into three parts and nine chapters. The second part begins with the *aural syndrome of hysteria*, according to different authors: Walton, Thomsen, Oppenheim, Lichtwitz, Gradenigo, and others, criticising their statements by citing the cases and remarks in their own publications. Then there follow the histories of thirty-six cases who presented ear symptoms out of fifty successive hysterical patients which Lannois had in his service and gave the author to examine. The latter gives the results of twenty-five of his examination, and adds them to a synopsis (pp. 112–113) containing the results obtained by the above-named authors. On page 27 is a diagram of the notation of tones by letters and numbers of vibrations. He says that the German-English system (letters C^{-2}, C^{-1}, C, c, c^1, c^2, c^3, c^4, counting by v. d.=double vibrations) more and more generalizes itself, whereas the French system, v. s. (single vibr.), is "still used in France, and deservedly so, because it was introduced by Gui d'Arezzo, from whose musical reform the gamut takes date." Aside from that, it avoids inconvenience and confusion from using large and small capitals. In the French system the above letters correspond to ut_1, ut_2, ut_3, ut_4, ut_5, ut_6 (p. 27). The author in his examinations uses these six tuning-forks, and gives the results in Hartmann's diagrams, graphically expressing percentage values. In the synopsis of cases he records the sensibility of the general integument, that of the external auditory canal and tymp. membrane, the acuteness of hearing for voice and whispering speech of each ear, the lateralization of sounds by Weber's test, and the air- and bone-conduction of Rinne's test. The clinical histories are carefully written. At the end of each part the case-histories are critically and comprehensively discussed.

---

[1] The passages put in quotation marks are literal translations.

The second part is divided into two categories: *otic symptoms in such patients as have only general symptoms, promiscuously, e. g.*, the well-known stigmas: great excitability, globus hystericus, fits of different kind and extension; irregular areas of hypoæsthesia and anæsthesia as to pain, heat, and touch; hysterogenous areas, touching of which will produce hysterical symptoms, especially spasm, such areas, among others, being the naso-pharyngeal mucous membrane, the regions above and below the breast, and especially that over the ovaries and testicles; all kinds of paralytic and emotional manifestations; in fact, there are no subjective symptoms, sensory and psychical ones included, that hysteria may not copy. The case-histories collected by the author furnish abundant evidence of the proof of this assertion. The sensibility of the skin of the outer ear and tympanic membrane is examined with a delicate probe, that of the E. tube and tympanic cavity by inflation, the catheter, and bougies, that of the mastoid by pressure. It should not be forgotten that the mastoid is also one of the hysterogenetic areas. Every experienced ear surgeon knows that pressure-pain, even when combined with some redness and doughy swelling over the mastoid, has been a part of the indications for extensive operations in which the mastoid was found perfectly healthy. On the other hand, we must be on our guard not to mistake aural and intracranial symptoms of organic disease for hysterical ones. A striking example of such happenings is contained in the valuable article on otitic meningitis, by Dr. Jacob Cohn, of Breslau, published in the present number of these ARCHIVES. From the case-histories in this part it follows that the degree of the aural symptoms—for instance, the deafness—is in no relation to the general symptoms of hysteria.

This holds good also for the second group, in which the patients suffered from hemihypoæsthesia or hemianæsthesia. The insensibility of the mucous membranes, however, is in closer relation to that of the skin than the degree of hearing is. The existence of unilateral deafness associated with hemianæsthesia cannot be doubted. Gellé, among others, has published several absolutely clear cases of that variety. It is well known that Gellé, while studying metallotherapy at the Salpêtrière, discovered the possibility of the transfer of the acoustic sensibility of a well-hearing ear to that of a deaf, or almost deaf, ear. The same possibility of transfer exists in all kinds of hysterical anæsthesias. The hearing function may differ in different ways; there may be a more or less uniform degree of impairment, as well as absolutely circumscribed areas in the range of audition (tone gaps, lacunæ). In accordance with Lichtwitz and Gradenigo, Fleury-Chavanne has found the Rinne always positive in hysteria—which demonstrates the nervous nature of hysteria. It is the same with Gellé's, Bing's, and Corradi's tests (centripetal pressure, secondary sensation, and restored sensation). They show that the hearing acuteness in hysteria undergoes considerable variations, and intermissions of deafness are frequent, which proves that the deafness in those cases is a phenomenon of exhaustion. In rare cases hysterical deafness appears in the form of the paracousis of Willis.

The *third part* describes *hysterical deafness* as a single symptom of hysteria, *l'hystérie auriculaire monosymptomatique.* Deafness is either the only or at least the preponderating symptom of hysteria. These cases are rare. They may be one- or double-sided. It may be the only symptom in the whole history of the case, or it may "accompany the symptoms of the neurosis covering for a moment the diverse chords, or it may awake dormant hysteria, which will then evolve even after the aural disturbance has disappeared." Its causes are the customary ones: emotion, fright, anger, suggestion, overwork, worry, etc.

Deaf-blindness (surdy-cecity) is extremely rare. No objective symptoms to be found in ears or eyes. Speech is frequently imperfectly articulated. The prognosis is favorable. The diagnosis rests chiefly on the sudden appearance, the lack of organic changes, and the appreciation of the patient's temperament, and other nervous symptoms. *Treatment* should begin as early as possible. *Suggestion* is an infallible cure, which every one may administer according to his liking, considering the conditions of the case. *Deaf-mutism* is one of the rarest manifestations of hysteria. Some cases in literature are of early date. Mercuriale mentions that Maximilian, son of Emperor Henry III., was a deaf-mute who, at the age of six years, recovered his voice, which he afterward used so brilliantly.

The reviewer has treated a girl of four years, mother highly nervous, rather dull and melancholic. The child did not speak, and pretended to be deaf. Physical examination negative. Without any other treatment than a gargle, she gradually recovered her hearing and speech. She is now about twenty-five years old, strong and well. Never complained of her ears again.

Hysterical deaf-mutism occurs in about equal proportions in different countries, but decidedly more in men than in women, 75 to 80 %. It may be monosymptomatic, or accompanied. It always disappears, mostly in a few days, or in some weeks or months, exceptionally in years. Treatment, as usual, in hysteria. "Ortolani has seen a case recover spontaneously under the influence of copious libations! In this time of leagues against alcohol, I should not dare recommend this mode of treatment."

Electricity, with a written suggestion previously handed to the patient, counts the greatest number of successes to its credit.

Otic Algies, as the author calls the hyperæsthesiæ of the different parts of the auditory organ, may be caused by hysteria in all varieties and degrees. He describes them under the following heads.

I. *Hyperæsthesia of the ear:* (*a*) sensitive, (*b*) sensory. The latter is subdivided into (1) true, (2) painful hyperacousis. The reviewer thinks that the first variety, hyperæsthesia auditiva, if it exists at all, is of no practical significance, whereas the other hyperacousis, or, better, hyperæsthesia auditoria dolorosa, is a condition more than exceptionally observed. It may be produced by one special noise, *e. g.*, on the crumpling of paper (Lannois). Gradenigo lays stress on the continuity of weak but continuous sounds—for instance, the ticking of a watch,—whereas strong but not continuous sounds are tolerated without special reaction. The reviewer has had totally different experience.

A lady of about thirty years was extremely distressed by short, explosive sounds, especially that of firearms, so that she would never see a theatrical performance in which there was a single shot. The explosion was not only a painful shock, but it caused also trembling, spasms, convulsions, and other nervous symptoms. The over-excitement of the acoustic nerve brought about a regular hysterical reaction.

The ear, therefore, is one of the

II. *Hysterogenic zones*, to which the author devotes a special paragraph (p. 198, etc.).

The single parts of the auditory apparatus may produce hysterical symptoms, to which special words have been given, *e. g.*, spasmogenic, hypnogenic, lethargogenic, etc.

III. *Hysterical vertigo of Ménière* should be distinguished from the ordinary vertigo of Ménière, inasmuch as to the triad of Gruber (hardness of hearing, tinnitus, and dizziness) it adds the stamp of hysteria by the presence of the symptoms of this neurosis, frequently with absence of organic changes in the hearing organ. Fleury-Chavanne dwells on this point and supports his statements by conclusive cases, personal as well as others. The two forms of Ménière's disease, the ordinary and the apoplectic, are represented also in the hysterical kind. Prognosis favorable; treatment symptomatic and by suggestion.

IV. *Hysterical otalgy* is rarely idiopathic, but mostly brought about by affections of neighboring parts, *e. g.*, pharynx, larynx, nose, teeth, and different parts of the ear itself. These are the true cause of otalgy ; hysteria only enforces their action.

v. *Hysterical mastoidalgy.* — Pain on and without pressure, even with some swelling and redness, always makes us think of mastoiditis. The absence of fever and of acceleration of the pulse will make us pause. Even if there is trouble in the ear itself, the pain may not be caused by it, but be one of the manifestations of hysteria. Before resorting to the knife, we should look out for the erratic symptoms of neurosis and, if there are any, apply antihysterical treatment, which, ex juvantibus, will bring us nearer to the correct diagnosis. As we mentioned above, the greatest errors have been made in this respect, and the author cites several striking and warning examples. The addition of a clear picture of hysteria should decide our action. Nevertheless we should not forget that a true mastoiditis, requiring operation, may occur in hysterical patients, and mastoid neuralgia in confirmed sclerosing mastoiditis is cured by even partial opening of the mastoid.

The next chapter (VIII.) is devoted to **Hysterical Otic Hemorrhages.** They are not accidental, but in connection of cause and effect with hysteria.

1. Most frequently they are *in relation with menstruation*, to which they are either *supplementary* or *complementary*. In the former case, they are a variety of the well-known vicarious hemorrhages in different organs ; in the latter, they add themselves to, or alternate with, a more or less irregular menstrual flow. Here two old cases in illustration (p. 256).

Dr. Jouilleton, 1813, says : Several times I have seen a woman, about thirty-five years old, who, for five years after abortion, has been menstruated through the right ear. A few days before the flow the ear was very painful.

Pinel, 1817. Miss A., since her twelfth year, hysterical crises, hematemeses. Then suppression of menses, which are replaced by hemorrhages located successively at the thumb, the legs, the inner canthus of the eye, the eyelid, navel (for five months), the left inner malleus (2 mos.), the left ear (2 mos.). When the blood did not escape through any fixed channel, epistaxis and hematemesis. Finally the menses reappeared.

In some cases, in spite of the amenorrhœa, or dysmenorrhœa, the search for hysteria is negative, as in the case of Lermoyez (p. 261) :

No stigmas, no true periauricular anæsthesia, only some hypoæsthesia in the right ear canal (the right ear is the seat of the hemorrhage.

A good illustration of the complementary menstrual oto-hemorrhage is by Eitelberg (p. 265).

Flow always through R ear.

June 24, 25, 1887, oto-hemorrhage ; in the evening of the second day the menses appear.

EDITORIAL NOTICE.

The ARCHIVES OF OTOLOGY is a bi-monthly journal, published in annual volumes of about five hundred pages each, extensively illustrated with cuts in the text, half-tone text plates, and lithographic plates, many in colors.

About three quarters of the space is devoted to original papers, and the remaining quarter to a systematic report on the progress of otology, and to reports of societies, book reviews, and miscellaneous notes.

The papers and reports are original, and only accepted with the understanding that they are to be published in this journal exclusively. The original papers in the English edition appear in the German (*Archiv für Ohrenheilkunde*) either in full or in more or less abridged translations, and *vice versa.*

Any subscriber that wishes to refer to the original text of a translated or abridged paper may, by applying to the editor, obtain a reprint which, it is expected, he will return after perusal.

Original papers of value from any source are solicited.

Communications for the English edition of the ARCHIVES OF OTOLOGY should be addressed to DR. H. KNAPP, 26 West 40th Street, New York, or to DR. U. PRITCHARD, 26 Wimpole Street, W., London, England.

The subscription price of the ARCHIVES OF OTOLOGY is $4.00 per year, payable in advance. The price per number is 75 cents.

The ARCHIVES is sent postage free in the United States, Canada, and Mexico.

CONTENTS OF VOLUME XXX., NUMBER 6.

PAGE

1. A Tumor of the Middle Ear Springing from the Inner and Posterior Tympanic Walls, Simulating Exostosis but Consisting of Calcareous Laminæ. By **William C. Braislin**, M.D. (With two microphotographs on Text-plate II.) 463

2. The Microscope as an Aid to Diagnosis and Prognosis in Chronic Suppurations of the Middle Ear. By **E. F. Snydacker**, M.D., Chicago. (With two text-illustrations) 466

3. A Case of Meningitis from Extension of Acute Purulent Otitis Media through Osteomyelitis of the Petrous Bone. Operation. Autopsy. Microscopic Examination. By Dr. **Arnold Knapp** . . . 474

4. Contribution on Otogenous Disease of the Brain, Meninges, and Venous Sinuses. By Dr. **Witte** and Dr. **Sturm**, Rostock. Translated and Abridged by Dr. EDWIN M. COX, New York . 482

5. Report on the Meeting of the New York Otological Society of May 28, 1901. By **H. A. Alderton**, M.D., Secretary . . . 491

6. Report of the Section on Otology, of the New York Academy of Medicine. By Dr. **Robert C. Myles**, Secretary . . . 500

7. Report on the Progress of Otology during the Second Quarter of the Year 1901. By Dr. **A. Hartmann**. Translated by Dr. ARNOLD KNAPP 518

8. Book Notices 550
    - VI.—The Accessory Sinuses of the Nose, their Surgical Anatomy, and the Diagnosis and Treatment of their Inflammatory Affections. By A. Logan Turner, M.D.
    - VII.—Manual of the Diseases of the Ear. By Thomas Barr, M.D.
    - VIII.—Diseases of the Nose and Throat. By F. de H. Hall and H. Tilley.
    - IX.—International Directory of Laryngologists and Otologists. Compiled by Richard Lake.
    - X.—Surgical Anatomy and Operative Surgery of the Middle Ear. By A. Broca.
    - XI.—A Treatise on the Diseases of the Ear, Including the Anatomy and Physiology of the Organ, together with the Treatment of the Affections of the Nose and Pharynx which Conduce to Aural Disease. By T. Mark Hovell, F.R.C.S.

9. Obituary. 554
    - Hermann Steinbrügge.
    - Friedrich Semeleder.
    - Adolf Fick.

10. Miscellaneous Notes 555
    - Appointments: Hansberg, Leutert, Hegner, Hinsberg.
    - Announcement: The VIIth International Otological Congress postponed.

11. Index to Authors and Subjects of Vol. XXX. 557

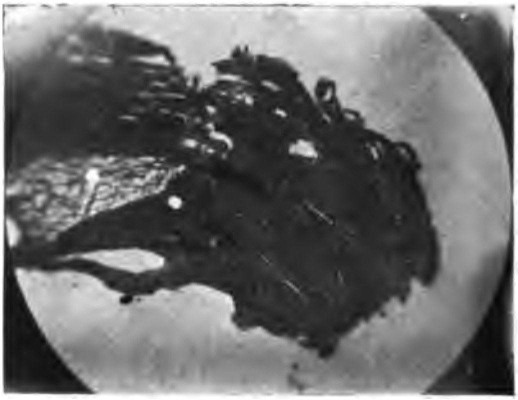


FIG. 1.—Micro-photograph of section of the growth, the seat of a calcareous degeneration, removed from the middle-ear.

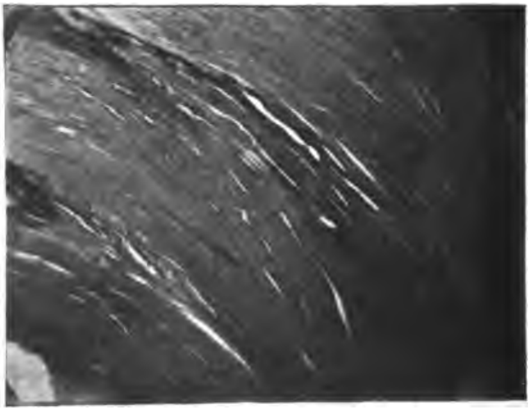


FIG. 2.—Same as Fig. 1. More highly magnified. The striated character of the growth is more plainly seen.

VOL. XXX. No. 6.

ARCHIVES OF OTOLOGY.

A TUMOR OF THE MIDDLE EAR SPRINGING FROM THE INNER AND POSTERIOR TYMPANIC WALLS, SIMULATING EXOSTOSIS BUT CONSISTING OF CALCAREOUS LAMINÆ.[1]

(With 2 micro-photographs on Text-plate II.)

By WILLIAM C. BRAISLIN, M.D.,

AURAL SURGEON WILLIAMSBURG HOSPITAL; ASST. SURGEON, AURAL DEP'T., BROOKLYN EYE AND EAR HOSPITAL.

I RECENTLY saw, in consultation with Dr. James Cole Hancock, a case which he regarded as one presenting unusual characteristics. The history of the patient is briefly as follows:

Miss E. G., thirty-five, has always enjoyed good health, and has never suffered from any attack of illness except scarlet fever, at twelve years of age, since which time there has been a discharge from both ears. This has been so slight as only to attract her occasional notice.

Recently, however, her attention has been drawn to the left ear, by reason of an occasional beating tinnitus, and by a change in the character of the discharge, which has become much more abundant than formerly and of a thin, watery consistency.

The right *Mt* presented a large perforation involving the entire anterior half and lower portion. Thick inspissated pus covered the floor of the canal.

The *left Mt* on first inspection was hidden by a rather thin, watery muco-pus. After drying this out, an unusual appearance presented itself. The entire membrane was wanting, but the cavity of the middle ear was almost entirely occupied by a smooth, glistening, pinkish-white, clearly outlined excrescence, which, on careful inspection, was observed to spring from a base entirely within the annulus tympanicus. A light probe glided readily over the growth; there was no grating under the probe, and the growth appeared to be everywhere covered with living membrane, the probe coming to rest along its entire periphery within the tympanic ring and at its posterior and inferior aspects very close to the latter.

---

[1] Read at a meeting of the Brooklyn Pathological Society, October 10, 1901.

Its attachment covered the posterior two-thirds of the inner wall of the drum cavity and almost the entire posterior walls, encroaching upon the *aditus ad antrum*, a discharge from which flowed over its surface.

It obliterated the landmarks of the tympanum, such as the promontory and round window, and was overridden by the handle of the malleus which it appeared to have pushed upward and outward. The malleus was ankylosed and immovable. The mass was attached by a broad base. It presented the appearance of a smooth bony growth springing from the middle-ear structures and covered with normal membrane. The inference drawn from the history and examination was that it was increasing in size, and encroaching upon a narrowed aditus which was discharging pus, and an opinion was rendered that an early operation would be a necessary and prudent measure.

September 10, 1900, *Operation* under ether was done with the assistance of Drs. J. C. Hancock, and B. C. Collins. A solution of suprarenal extract was used locally to control bleeding, with very gratifying result.

It was our supposition that the mass would be found of a hard and unyielding consistency and that the force of the concussions of the gouge and mallet in the immediate vicinity of the underlying cochlea and vestibule would create considerable shock and perhaps temporary disturbance of equilibrium. The patient was therefore forewarned of the probable result.

An agreeable surprise was encountered in the ease with which the mass yielded to the attack. A small gouge pierced the mass under the first moderate taps of a light mallet. The finger holding the cutting instrument easily detected the entrance of the instrument as the thin shell gave way, which then, after careful dissection with the curette and use of the forceps, was entirely removed in fragments, leaving the tympanum with its normal cavity re-established and its landmarks *in situ*. The ossicles were ankylosed *en masse* and were not removed, except the tip of the manubrium.

The fragments re-constructed showed a thin, convex shell, of bone-like consistency, with a transverse diameter of about ¼ of an inch; smooth on its convex or outer, and rough on its concave or inner aspect.

No event of importance followed the operation. The discharge has almost entirely disappeared.

The most prominent portion of the mass was submitted to Dr. Archibald Murray, for microscopical examination and reference to a micro-photograph of a typical section will reveal its microscopic appearance. Dr. Murray's report was as follows:

"In examining the small mass from the ear I find no evidence of true bone formation. The piece was very hard and had to be decalcified, and under the microscope shows a laminated structure which has been the seat of a calcareous deposit. The dark purple areas represent incomplete decalcification. Small masses of cartilage are seen in some places."

The section from which the micro-photograph is made has been cut vertically to the plane of its long axis. The smooth edge represents the outer, and the rough, the inner surface of the growth.

The specimen under consideration, from which the sections were made, is apparently a calcareous degeneration of some previously existing growth in the middle ear. Its peculiar appearance under the microscope is most easily accounted for by supposing the first condition to have been a fibroma (fibromatous polyp).

Calcareous degeneration of middle-ear tumors, of hyperplasias, and of polypoid granulation have, I believe, previously escaped notice. It would therefore seem that growths in the middle-ear cavity which have become the seat of calcareous deposit are rare.

THE MICROSCOPE AS AN AID TO DIAGNOSIS AND PROGNOSIS IN CHRONIC SUPPURATIONS OF THE MIDDLE EAR.

By E. F. SNYDACKER, M.D., Chicago.

(With two text-illustrations.)

THE microscopic examination of the centrifuged washings from the middle ear not infrequently proves of great value as an aid to diagnosis and prognosis in chronic cases of suppurative middle-ear disease.

For over a year, I have made it a routine practice to examine microscopically the sediment of the washings from the middle ear in all such cases where the discharge has continued a year or over, and out of a very limited clinical material (13 cases in all) there were three where the microscopic findings caused me to materially change my views as to the treatment and outcome of the case. When one can convince himself that *epidermis is present in the washings, and has undoubtedly come from the middle ear*, whether it presents the concentric arrangement, containing fat and cholesterin crystals typical of cholesteatoma, or whether it is merely present in shreds showing no signs of concentric arrangement or of degeneration, *and when it persists, even after a rational treatment has been continued for a reasonable length of time*, it is a symptom no more to be ignored than the presence of albumen or casts in the urine. And while I do not at all agree with Bezold[1] when he says, "The smallest shreds of epidermis, if it can be shown that they have come from the middle-ear spaces, suffice to make the diagnosis of cholesteatoma," nevertheless I do believe their continual presence in the discharge is a symptom which must be taken seriously.

---

[1] *Überschau über den gegenwärtigen Stand der Ohrenheilk.*, Wiesbaden, 1895, p. 119. Blau, "Bericht über die neueren Leistungen in der Ohrenheilkunde" (*Schmidts' Jahrbücher der gesammten Medicin*, 1897, p. 189), quotes Bezold and gives reference.

Another microscopical finding which must be considered of the greatest importance, irrespective of the clinical aspect of the case, is the *continuous presence of bone dust in the sediment*, and the greater the amount the more is the importance of the finding. I have never been able to convince myself that a bacteriological examination of the middle-ear discharges was of any value whatever in determining the outcome of a case. The presence of tubercle bacilli, if demonstrated, would, of course, materially affect the treatment and prognosis of a case, but their demonstrable presence, even in cases which are manifestly tuberculous, is so rare and uncertain that their absence means but little.[1]

Blau[2] ascribes importance to the presence of *cholesterin crystals in the discharge*, even though no epidermis is present.

My experience does not bear out this assertion; in two cases which have come under my observation, in both of which the discharge had become stagnant and offensive because of insufficient drainage, cholesterin crystals were present in considerable quantities, in one case associated with small quantities of epidermis, in the other case no epidermis was present; in both cases, when the middle ear was thoroughly cleaned out and proper drainage instituted the cholesterin crystals promptly disappeared.

Inasmuch as the method of treatment, as well as that for examining the washings microscopically was the same in all the cases which I am about to describe, it will avoid repetition to describe these methods of procedure before entering on a detailed account of each case.

The treatment of all of these chronic suppurative cases consisted in the thorough irrigation of the tympanic cavity with a sterilized solution of boracic acid. The frequency of irrigation varied according to the nature and amount of the discharge; in some instances it was not carried out more than once a week, in others it was repeated three times a week. The irrigation was conducted in the usual manner, by means of a tympanic canula, with the point bent at a suitable angle, according to the nature of the perforation. This was introduced into the middle ear with the tip pointing toward the attic and the tympanic cavity well irrigated. The ear was then thoroughly dried by wiping with absorbent cotton, and instilling 95 per cent. alcohol as long as the patient could bear it with comfort; after which a current of air was blown into the ear. A gauze drain was then inserted.

---

[1] Grunert, *Arch. f. Ohren.*, xl., 3 and 4, 1897

[2] *Berl. klin. Wochenschr.*, xxxiii., 2, 1896.

Each patient was given a number of sterilized cotton plugs which were kept in a wide-mouthed bottle, that had been rendered aseptic by washing well with alcohol. The patient was instructed to buy a small pair of forceps, whose points were to be dipped in alcohol each time before using. When the gauze drain in the ear became saturated it was removed by the patient or one of the family, a cotton plug picked from the bottle with the forceps, and without handling with the finger introduced into the auditory meatus, and left there till it became saturated. The washings were examined microscopically in the following ways: The external auditory meatus was first thoroughly cleansed so that I could feel certain that the sediment in the washings came from the middle ear alone and none of it from the meatus.

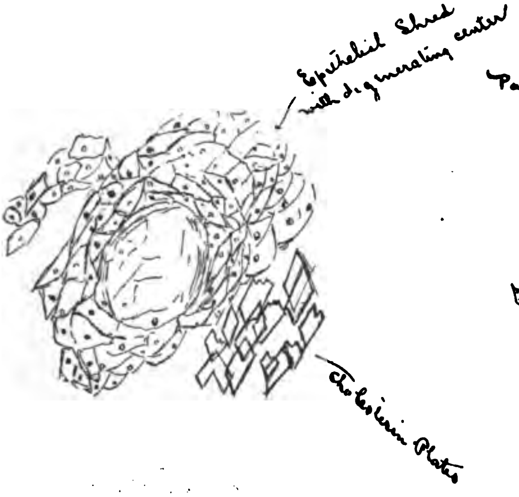
Portions of the washings which seemed to contain the most sediment were centrifuged, and the sediment was examined in the following manner: One drop was placed on a slide and examined immediately without staining; cholesterin crystals and epidermis could be easily identified in this manner; to another portion of the sediment a drop of picro-carmine was added, it was then spread on a slide and examined microscopically. For detecting particles of bone the following method gave the best results: some of the dried sediment was fixed on a slide with albumen fixative, stained with hæmatoxylin and eosin, dehydrated with alcohol, cleared with carboxylol, and mounted in Canada balsam.

In the following three cases the microscopical findings were deemed of enough importance to materially influence the treatment and prognosis of the case.

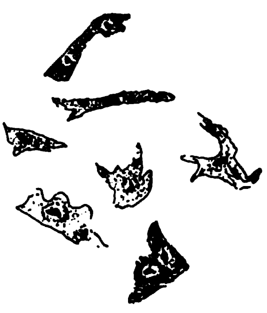
Case No. 1.—**Chronic otorrhœa; cholesterin, epidermis, and bone dust in the discharge. After two months' treatment, bone dust still present. Operation not consented to. Patient dismissed.**

John C., Irish boy, aged thirteen; father and mother alive and well; a sister aged nine has had a discharging ear which at present is well; two brothers died when young, cause of their death unknown, although inquiry elicited that one had had a discharging sore in the neck, probably due to suppurating glands.

The patient himself has had measles, diphtheria, and grippe. Four years ago while he had measles the ear began to discharge: it discharged for about one year and then became apparently well, although no treatment was instituted at any time; it continued well for about six months when patient contracted diphtheria; the ear at that time again began to discharge and the discharge has continued up to the present time.



Case No 1.



Case no 1.

Present Condition.—Patient is pale and listless, though of good frame and weight. On the entrance of the patient a disagreeable odor became apparent. The meatus was filled with offensive brownish pus: when the canal had been cleaned a large perforation was found in the posterior inferior quadrant of the drum membrane which in one place extended as far as the annulus. The tympanic mucous membrane was seen to be intensely red and swollen, no granulations or polypi, however, could be seen. No denuded areas of bone or fistula could be found with probe. Thorough irrigation of the tympanic cavity brought away a large amount of foul-smelling debris in which, on microscopic examination, were found quantities of cholesterin, crystals, masses of epidermis, and fine particles of disintegrated bone. See figures, p. 469. After one month's treatment, the ear was still discharging freely, although the odor had entirely disappeared and neither cholesterin crystals nor epidermis could be found in the discharge; bone dust was, however, still present in the sediment. The same treatment was continued four weeks longer without material change; at the end of that time bone particles were still present in the sediment. An operation was now strongly advised and as the mother refused to consent to an operation I declined to treat the case longer and lost sight of it.

CASE NO. 2.—**Old otorrhœa; offensive discharge containing round masses of horny epithelium, some concentrically arranged fat and cholesterin. Operation not consented to. Patient not accepted.**

Mary G.—aged twenty-six, a cook, strong, red-cheeked, healthy-looking girl, comes because of a long-continued suppuration in the right ear. The trouble began in childhood, after an attack of scarlet fever; at that time both ears discharged, but after a while discharge from the left ear ceased, while that of the right ear has continued to the present time. Family history and general health are good, although patient finds that a hard day's work tires her more than it formerly did, and several times in the past six months she has had headaches from which she had never suffered in previous years.

Present Condition.—The meatus of the right ear is filled with a scanty, greenish, offensive pus and crusts. The drum membrane is red and thickened, with a large kidney-shaped defect around the hammer handle; a partial synechia between drum membrane and inner tympanic wall prevented free exploration with a probe. Irrigation of the middle ear brought away much debris from the tympanic cavity, in which were a number of small round masses, some of them having a lustre when straightened out, and several of them of such a size that it seemed remarkable how they had made their way through the perforation in the drum membrane.

Microscopic examination showed that these masses consisted of horny, squamous, epithelial cells, in many cases concentrically arranged around a small mass of debris, the cells themselves taking a diffuse stain, showing but few nuclei, containing in many instances fat and cholesterin crystals; usually the boundary between the individual cells was well marked, but at times there were areas which showed a diffuse yellow tinge, where demarcation between individual cells was lost.

I thought this finding of sufficient importance to advise immediate operation; this, however, the patient refused. At the end of the third week the patient no longer returned to my clinic, and I lost sight of the case, no second microscopic examination of the sediment having been made.

CASE No. 3.—**Otorrhœa in childhood. Started again three years ago. Discharge containing shreds of epidermis in the sediment; no crystals; traces of bone dust. Topical treatment six weeks. Bone dust disappeared. Operation refused. Patient lost sight of.**

Yetta C., æt. 17. Family history is negative. General health bad. Patient is subject to severe headaches, which have, however, not grown worse since ear trouble started. She has dysmenorrhœa and at times amenorrhœa. She is pale and anæmic and her face is covered with acne vulgaris.

The left ear started to discharge about three years ago. She does not remember being ill at the time, although there was some pain in the ear at night and next morning it was discharging. She believes that both ears discharged when she was a child.

Present Condition.—Meatus of left ear is filled with a scanty yellowish-white discharge and crusts. The discharge has no bad odor. In the superior-posterior quadrant, reaching almost as high as the posterior fold and in one place extending to the annulus, is a large perforation. At the outer edge of the perforation are several granulations, about the size of pin-heads.

Microscopic examination of the washings revealed shreds of epidermis in the sediment, no crystals, a trace of bone dust. The shreds of epidermis consisted of masses of large squamous epithelial cells, many of them showing no nuclei, many of them having undergone keratosis, but in most instances the boundaries of the cells were well defined.

The drainage in this case being good and the discharge scanty, but few irrigations were employed; the treatment consisted mainly of the instillation of an alcoholic solution of boric acid, and drainage by means of gauze drains inserted by myself, and cotton ones inserted by the patient. At the end of six weeks epidermis shreds were still present in the discharge, although no bone dust could be found. Operation was urged, but in this case too the patient refused an operation, and I soon lost sight of the case.

In these three cases, especially when treatment lasting from one to two months had proven of no avail, in my judgment, the microscopic findings warranted a radical operation. Where the symptoms are not urgent the patient will almost invariably refuse an operation, but to continue a long course of treatment, in the face of such findings, is to run the constant risk of very serious complications, and to my mind it is far better to refuse to treat the case further, where an operation is refused, than to enter on a long and tedious course of treatment which will in all probability end in disaster. It must not, however, be forgotten that after a long-continued suppuration of the middle ear the mucous membrane becomes denuded in places, and such surfaces may by a reparative process become clothed with epidermis, an outcome which may be entirely favorable, and, far from indicating cholesteatomatous formation in the middle ear, is one means which nature has devised of effecting a cure. It is only when the discharge persists after this epidermis formation has begun, when by its constant irritating contact it causes over-production of epidermis, and this is constantly cast off, as is shown by its continual presence in the discharge, that its production must be regarded as a dangerous symptom. One cannot, therefore, on a single finding of epidermis shreds, make a diagnosis of cholesteatoma or advise an immediate operation; it is only when these shreds are present and the discharge persists for weeks, and even months, that it is safe to regard them as a danger sign. It is otherwise, however, when the process has gone so far that the epidermis presents the concentric arrangement known as cholesteatoma. When we can convince ourselves that cholesteatomatous masses are present, all delay is detrimental to the best interests of the patient, and it is far better to give up the case at once, than to enter on a fruitless and dangerous treatment.

As to the indications when bone dust is present, there may be a difference of opinion: if the carious bone has its source in the ossicles, and the tympanic walls and mastoid cells are intact, then there can be no danger in delay. When, however, we remember the findings of Grunert (*Arch. f. Ohrenh.*, xl., 3 u. 4, p. 189, 1896), who in 108 cases of caries of the middle ear found only two where the ossicles alone were involved, while either the tympanic walls or mastoid cells were involved in all the other cases, we must agree that where carious bone is present in the discharge, and persists after thorough treatment has been instituted, a radical operation is surely the most conservative course.

A CASE OF MENINGITIS FROM EXTENSION OF ACUTE PURULENT OTITIS MEDIA THROUGH OSTEOMYELITIS OF THE PETROUS BONE. OPERATION. AUTOPSY. MICROSCOPIC EXAMINATION.

BY DR. ARNOLD KNAPP.[1]

Mrs. B. S., thirty-one years old, was first seen on February 6, 1901. She had been taken ill six days previous with severe pain in the left ear followed by bloody discharge and profuse otorrhœa during the last two days. The patient is otherwise in good health, except that she is suffering from some pelvic disorder which gives rise to a chill and high fever at irregular intervals. The canal is inflamed, there is a large perforation, and the mastoid is red and very tender. Temperature 100°, pulse 120. There is no sagging of the superior wall.

She was put to bed and an ice-bag applied to the mastoid for thirty-six hours. The pain was thus relieved, but returned with renewed severity after the removal of the ice ; the mastoid was especially tender directly over the mastoid fossa and along the posterior border. A free discharge continued. The upper wall did not sag. Temperature 99°.

Operation.—February 8th, the mastoid process was found very hyperæmic ; there were some granulations in a few of the posterior cells. The antrum was small, very high up, and contained no pus. On the 9th of February a slight chill ; temperature 102°. Her general condition then improved. There was no fever, no pain ; discharge from the ear canal continued.

On the 16th she had a chill ; temperature went up to 104°, pulse 120. On the following day the temperature was down again, but the otorrhœa continued, and there was also some pus coming from the mastoid wound. No particular change until the 23d, when pain again set in due to a furuncle of the canal.

---

[1] Read at the meeting of the Otological Section N. Y. Acad. of Med., Nov. 13, 1901.

On the 27th the patient had another chill with high fever. Her condition otherwise was satisfactory, and she was allowed to go home on March 5th. Slight otorrhœa; mastoid fistula leading down to uncovered bone in the region of the antrum. She returned regularly for dressings. The discharge gradually grew less until March 17th, when she had a very severe chill, and was re-admitted to the hospital on the following day. The discharge from the ear canal was again profuse; the wound in the back was closed and clean. Her temperature was 102°. She complained of being very deaf in that ear.

On the following day, the 19th, the profuse otorrhœa continued and the general condition seemed to be better until suddenly in the afternoon she complained of very severe pain in the left half of her head. She was restless and passed a poor night.

On March 20th, slight stupor; very severe pain in the head, back of neck, and back. Right pupil was dilated, slight ptosis, optic discs showed haziness in lower margins, vessels were tortuous, and there were a few retinal hemorrhages. Some delirium. Temperature had gradually gone up to 103.8°, pulse 125. At eight o'clock on that evening she was again operated on.

Operation.—The sinus was first exposed. The neighboring dura was found normal. The sinus was normal in appearance and to touch. There was free bleeding from the mastoid vein. The tegmen of the antrum and tympanum were then removed. The dura was everywhere found normal and the brain was punctured with a small knife in many directions without any result. The middle ear was filled with granulations and pus.

March 21st.—The patient is conscious but apathetic. There is right slight exophthalmus, severe headache, and great pain on rotating head. She complained of very great pain in the top of the head when her bowels were moving. The temperature remained high, about 104°, during all that day. Pulse 130. The patient can be aroused by speaking to her and takes nourishment. In the evening she became very restless and had a slight chill. The urine contained some blood and a great deal of albumen.

On the following days, March 22d and 23d, the patient grew gradually worse, hiccough and vomiting set in, she was restless and delirious, fæces and urine were voided involuntarily, and on the morning of the 24th, after general convulsions, she died. The temperature during the last two days had remained constantly high, and the pulse between 100 and 120.

Autopsy at 12 M.—A horizontal incision was made through the brain. On lifting up the lower half, pus was encountered about the pituitary gland extending backward down to the clivus. The meninges of the cortex seemed normal. The sinuses contained fluid blood. The tentorium was incised and pus was found surrounding the left cerebellum, especially the upper, the anterior, and the outer surfaces. A tenacious, purulent membrane was found attached to the dura just back of the sigmoid sinus and another over that portion of the posterior surface of the petrous bone lying between the sinus and the internal auditory meatus. In the spinal canal there was a great quantity of purulent fluid. The cerebellum was normal. Cover-glass specimens of the fluid from the spinal canal revealed streptococci in long chains. The operative wound was clean except for some pus in the middle ear. The internal auditory meatus and the nerves seemed unchanged. On the posterior surface of the petrous portion, *at a point midway between the sigmoid sulcus and the internal auditory meatus, there was a well-defined, small, reddish swelling*, like a bunch of granulations, which seemed to be partly in and partly under the dura. This corresponded to the site of the ductus endolymphaticus, the end of the aqueduct of the vestibule. The petrous bone was removed and prepared for microscopic examination in horizontal serial sections.

Microscopic Examination.—The inner wall of the tympanum was the seat of an intense inflammation, the bone being superficially affected. The niche of the oval window was filled with inflammatory products. There seemed to be a minute perforation through the oval window. The stapes as such could not be identified. There was slight inflammatory involvement of the vestibule, especially of the perilymphatic spaces. This extended to the beginning of the eighth nerve and also partly along the external semicircular canal. The cochlea also was slightly affected, but the other semicircular canals, especially the posterior vertical, appeared normal.

Below the round window a fistulous tract measuring 2 *mm* in breadth extended in the cancellous bone below the labyrinth from the inner tympanic wall forward and inward for about 1 *cm*.

The cancellous bone inferior and posterior to the labyrinth was the seat of an intense osteomyelitis. Resorption of bone had taken place, the intervening spaces were filled with inflammatory products. New bone and fibrous tissue were visible. An abscess had formed in the bony tissue, which, at one point situated near the posterior surface of the petrous bone corresponding to the macroscopic lesion found at autopsy, had distinctly broken through the cortex and invaded the dura. In successive lower sections this abscess was seen to gradually leave the proximity of the posterior petrous surface and the site of perforation and to assume a more central position underneath the labyrinth, where it communicated with the fistulous tract from the inner tympanic wall.

In the direction opposite to the site of perforation, the destructive inflammatory process could be seen to invade the condensed bony labyrinth wall near the posterior vertical semicircular canal, and would in time have invaded the latter structure, causing an involvement of the labyrinth.

From the findings at autopsy it seemed probable that the meningitis originated from the perforation visible to the naked eye at the posterior petrous surface. The connection of this perforation with the inflamed tympanum was made clear by the microscopic examination. A fistulous tract was discovered below the round window leading to an intense inflammatory focus, a beginning abscess, situated below and back of the labyrinth, which at the above-mentioned point had perforated through the cortex.

Similar osteomyelitic processes in the petrous bone have been observed as direct extensions from the inner wall of the antrum, from the cancellous structure on the inner wall of the tympanum above and below the labyrinth capsule, or from an infection of the labyrinth extending by perforation of a semicircular canal or along the aqueduct of the vestibule. Jansen, in an article "On Deep Extradural Abscesses in the Posterior Cranial Fossa Secondary to Labyrinth Suppuration" (*Arch. f. Ohrenhlk.*, vol. xxxv.), reports a case of acute otitis media where a fistulous tract was found just above the horizontal semicircular canal extending transversely inwards to an extradural abscess on the posterior surface of the petrous bone, at a point corresponding about to the conjoined arms of the vertical canals; this tract communicated with the posterior vertical canal and the vestibule. He further states that perforation of the conjoined arms of the vertical canals is not very infrequent and significantly occurs in cases of acute otitis running a protracted course. Jansen has also observed cases where the pathological changes in the bone and dura have extended outwards, which under certain circumstances would be quite accessible to operation. The prominent symptom in these cases was one side headache in the forehead, eye, or occiput, which persisted after the opening of the mastoid process. This symptom was absent in our case.

Habermann[1] has described a number of cases of involvement of the petrous bone in acute purulent otitis with a most careful description of the microscopic changes found present. In some the entire petrous bone was affected, abscesses had formed in the bone, sometimes perforating through the adjoining surface of the petrous pyramid or into the labyrinthine structures; in others the chief changes were found in the cancellous tissue situated above and below the bony labyrinth.

The probability of the extension of the osteomyelitis from the inner tympanic wall to the structures above and below the labyrinth depends to a certain extent upon the presence of cancellous bone in these situations. If the intervening layer of bone between the middle cranial fossa and the labyrinth on one hand, and between the jugular bulb and the labyrinth on the other, be thin, it is usually compact and hard, thus furnishing a barrier to pyogenic extension in the bone. Especially in the region below the labyrinth, which is involved more frequently than the area above, great variations in the size and density of bone exist.

I was able to observe this spring, in Dr. Jansen's service, a case of infection of the cancellous structures below the labyrinth with a fistula passing through the petrous bone and emerging under the dura at a point interior to the internal auditory meatus.

---

[1] Habermann, Ueber Erkrankung des Felsentheils und des Ohrlabyrinths infolge der acuten citrigen Mittelohrentzündung, *Arch f. Ohrenhlk.*, vol. xlii. p. 128.

It is stated that infection of the labyrinth is the most frequent complication of aural suppuration. According to Hinsberg, who has just published in the *Zeitschrift für Ohrenheilkunde*, vol. xl., p. 117, an admirable and exhaustive article on "Suppurations of the Labyrinth," the site of entrance of infection is generally the horizontal semicircular canal or the oval window. The former preponderating greatly in frequency over the latter, and occurring practically only in chronic cases. In our case the stapes was principally gone, there was a great deal of inflammatory tissue in the niche of the oval window, and a small perforation seemed to be present; the changes in the vestibule and canals were hardly sufficient to account for the bone lesion found near the posterior surface of the petrous bone. It is generally very difficult to gain much information as to the histological conditions found in suppurating labyrinths from the accounts in literature. Cases of clear infection through the labyrinth often have shown very few anatomical changes; in other cases the changes have been limited to certain parts of the labyrinth. The usual clinical symptoms of labyrinthine involvement were wanting in our case, a point to which I beg to be allowed to return later on.

It is apparent that infection, once in the labyrinth, extends along pre-formed channels; these are the passage for the VIIIth nerve and the aqueducts. Hinsberg (loc. cit.) found 108 cases where the interior of the skull was affected secondarily to labyrinth suppuration; the extension could be determined definitely in 43, namely: 25 along the internal auditory canal, 1 along this canal and the aqueducts, 8 by the aqueduct of the vestibule, 1 by the aqueduct of the cochlea, and 8 by perforations of the vertical canal. In regard to the last form of extension, our specimen shows the facility by which a suppurating osteomyelitis can invade a semicircular canal, and we are inclined to question whether the perforation of the canals quoted above was always the result of an action from within.

Extension along the auditory canal produces a rapidly fatal meningitis. The internal auditory meatus was unaffected in our case. Extension along the aqueduct of the vestibule has been observed to form an empyema of the saccus endolymphaticus where the process may, for a time, remain localized. Jansen believes that the possibility of a cure by operation of such a condition is not out of question. In our specimen the chief focus in the bone was at about the termination of the aqueduct. The aqueduct, as has been stated, could not be identified.

All of these processes have this in common, that they attack the structures on the posterior surface of the petrous bone, causing a diffuse or circumscribed meningitis, or a cerebellar abscess.

A suppurating process in the posterior cranial fossa usually extends down the canal, producing typical symptoms of spinal meningitis, as has been pointed out by Oppenheim and others.

To recur to the clinical course of our case, the chills and high fever occurring irregularly after the first operation were traced to the pelvic condition of the patient as they were unlike the symptoms of otitic pyæmia. The fact that at the first operation there was nothing found, is a coincidence which has been noted before, and should be regarded with great distrust; the symptoms, however, did not continue with the exception of the otorrhœa. The onset of meningitis was evinced by the severe headache, pains in the back, the continuation of the high fever and ocular symptoms. The second operation also failed to reveal the nature of the disease; there was no fistulous tract to guide us, at least none was found. A symptom referable to involvement of the cord low down was the excruciating pain on movement of the bowels. Before the onset of the severe symptoms, our patient complained of the marked deafness of the affected ear. If the labyrinth was involved in this case, this was the first and only symptom. Generally, involvement of the labyrinth is characterized by a series of well defined symptoms, as vertigo, nystagmus, deafness, vomiting, and headache. The first three are referable to functional interference of the organs contained in the labyrinth. In localized disease of the semicircular canals, the hearing may not be much affected. The difficulty of determining diminution in hearing in some of these cases is apparent. Vertigo, according to Hinsberg, has not been noted in certain cases of internal-ear suppuration, though it is the most constant symptom.

A final word as to treatment. Suppurations along the internal auditory meatus are, of course, not accessible. But this case and several others show that there is an area situated somewhat more externally, which may be a pyogenic centre, and which we ought to endeavor to eradicate. The symptoms in these cases are often of a slow enough course, at least for a certain time, to warn us and give us time to act. As fistulæ from the internal antral or tympanic walls have been known to lead to this area, we should follow Jansen's suggestion to search most diligently for fistulæ in these situations, or to remove the upper and posterior border of the petrous bone. If definite signs of a labyrinthine involvement and symptoms of beginning meningitis are present, after exclusion of the more usual forms of extension, we should not hesitate to invade the labyrinth.

CONTRIBUTION ON OTOGENOUS DISEASE OF THE BRAIN, MENINGES, AND SINUSES.[1]

BY DR. WITTE AND DR. STURM, ROSTOCK.

Translated and Abridged by Dr. EDWIN M. COX, New York.

IV. (*Continuation*).

33. Sinusphlebitis from acute mastoiditis. Operation. Recovery.

Richard K., æt. five, sought medical treatment October 18, 1900, on account of an exanthem of undetermined character. Pain in the left ear developed October 24th, and three days later discharge occurred spontaneously. On November 1st he was sent to the ear clinic because there was tenderness in the mastoid region.

The condition on admission was as follows: pulse rapid and regular; left drum membrane reddened, swollen, and perforated behind the umbo. Through this perforation, pus flowed freely, and the whole mastoid was tender on pressure. Temperature, 37.5° C. in the evening.

The perforation was enlarged and next day the discharge was considerable. Pulse 120 to 130; appetite poor.

Nov. 3d.—Suppuration undiminished. Evening temperature somewhat higher.

Nov. 4th.—Morning temperature 40.1° C.; aural condition unchanged; patient lies apathetically in bed, and answers questions slowly. Eyes and lungs normal. No swelling in the neck, and no apparent involvement of the cervical veins. The mastoid was opened the same evening.

Operation.—Granulations filled the mastoid cells and had already broken through the corticalis, and there was some pus in the antrum. The dura showed a few patches of purulent deposit and some granulation tissue upon its surface, but it pulsated. The sinus felt soft, but was not compressible, and where it was opened, it disclosed a grayish-red, soft, but not purulent thrombus. When this was cleared away, free bleeding occurred, and a considerable clot came from the direction of the torcular. The wound was tamponed and treated in the usual way.

---

[1] From the Ear and Throat Clinic of Rostock University.

Recovery was continuous, and on January 5th the retro-auricular wound was closed, and there was very little pus in the ear. Later, the ear became entirely clean and the patient was discharged cured.

34. Sinusphlebitis and pyæmia. Operation. Death from meningitis and metastases in the lungs. Autopsy.

M. P., æt. twelve, admitted to the clinic December 13, 1900. Nine months previously he had developed suppuration in the left ear, but this had not caused any inconvenience. Three weeks before admission, headache developed, followed by chills and vomiting, but he had no medical attendance for eight days. His condition became worse and he was consequently brought to the hospital where his condition was as follows: pale, tongue swollen and coated, head stiff and inclined to the left, retro-maxillary fossa infiltrated, left auditory canal full of granulations, and the cutaneous veins dilated. The respiration was abdominal and superficial, 48 to the minute, but no physical signs of pneumonia. Pulse 138, temp. 39.9°. Sensorium and eyes were normal.

Operation, Dec. 14th.—Auditory meatus first cleared of many freely bleeding granulations. Free incision in mastoid region showed loose periosteum and many bleeding orifices in the bone of the mastoid. When this was chiselled open there was a profuse flow of pus and blood, which was found to come from the sinus sigmoideus, in which there were also dark thrombus-masses. The latter were scraped away, and the sinus was packed. In the mastoid there was a granulation-lined cavity which communicated with the mastoid antrum. This was also scraped out. The patient was in bad condition and did not improve in spite of active treatment. He became unconscious on the second day and died on the third.

Autopsy showed pia mater of the convexity translucent and free from œdema, as was also the case with most of the pia of the base. The pia on the base of the cerebellum showed marked purulent infiltration. Brain substance apparently normal. Over the tegmen of the mastoid antrum, the bone appeared greenish. The dura in the whole region of the operation wound was covered with foul thick pus. The antero-external wall of the sigmoid sinus was entirely destroyed, and the sinus was closed somewhat above the upper knee. The internal jugular vein was filled by a thrombus as far as the vena anonyma, which was adherent to its walls, and most of the veins on that side of the neck were filled with firm clot. Heart normal. Lungs contained numerous hemorrhagic areas, in the centres of some of which gangrene had begun. Other organs showed nothing significant.

When this patient was operated upon, it was clear that his condition was very bad. The only result of the operation was that the headache ceased during the few remaining hours of life. No change was seen at any time in the optic papillæ.

35. Perisinuous abscess in acute mastoiditis. Operation. Recovery.

N. S., æt. eleven. Admitted August 11, 1900. Had scarlet fever two years ago, and a few weeks before admission he developed an acute purulent otitis media on the right side, accompanied by fever, pain, and purulent discharge. The boy had previously been operated upon for enlarged cervical glands.

He has extensive scars on the side of the neck and the carotid artery is very thinly covered. There is much pus in the auditory canal, but no swelling or sensitiveness in the mastoid region. The drum membrane is perforated in the antero-inferior portion; elsewhere it is bulging. Temperature 37.3° C. The bulging membrane was incised and a quantity of pus evacuated, after which the temperature remained normal until September 4th, on which date it began to go up and the mastoid developed tenderness.

Operation, September 6th.—Mastoid opened and antrum found full of granulation tissue. Pus was found between the bone and the sinus transversus. The bone was softened downwards for some distance in the direction of the stylo-mastoid foramen, but while this was being scraped away there were no contractions of the facial muscles.

When the patient recovered, however, he had facial paralysis. The wound healed by granulation and the patient gained in weight. No microscopic evidences of tuberculosis.

During the operation palpation did not disclose any abnormity in the jugular vein, and puncture was not indicated. The extension of the bone involvement in the direction of the stylo-mastoid foramen was unusual.

36. Extradural abscess in the posterior fossa after mastoiditis from measles. Operation. Recovery.

D. S., June, 1900, eight days after beginning of measles, had suppuration in left ear.

July 30th.—Left auditory canal full of pus, mastoid swollen and tender, some swelling of soft parts below mastoid.

Operation, July 31st.—Pus under considerable tension was evacuated from the mastoid. Corticalis thin, removed with forceps ; sinus pushed forward and covered with granulations, as was the case with the neighboring dura. The antrum was opened and cleared of some thick pus. Dura pulsated everywhere. Patient made a complete recovery in six weeks.

37. Extradural abscess in posterior fossa after mastoiditis from scarlet fever. Operation. Recovery.

V. V., æt. forty-five, came to the clinic August 8, 1900.

He had scarlet fever twelve weeks before this, and suppuration began in his left ear nine weeks ago. Eight days ago a swelling appeared behind his left ear. At present he is in good general condition ; the left auditory canal is partially filled with pus, and on its posterior wall there is a circumscribed swelling. The whole mastoid region is swollen, but does not fluctuate.

Operation, August 9th.—As soon as the interior of the mastoid was reached, pus flowed freely from a large cavity lined with discolored granulations. The dura of the cerebellum and the sinus sigmoideus lay exposed in the cavity. The subsequent course of this case was normal and the patient was discharged healed October 3, 1900.

38. Purulent leptomeningitis after chronic mastoiditis. Death. Autopsy.

Child, æt. seven, brought to clinic September 9, 1900. Five years previously the child had had diphtheria followed by suppuration in left ear, but only recently has suffered from headaches and pain in the left side of the head. The ear was full of foul pus, and the drum membrane showed a large perforation into which granulations from the tympanum were pushing. Rough bone could be felt in the tympanum. The mastoid is not tender. Eyes normal, no nystagmus.

Operation, October 20th.—Periosteum over mastoid adherent and bone very hard. Cells in mastoid large and full of foul pus and granulations. The wound was enlarged and the apparently healthy sinus exposed. Antrum cleaned out. Incus and malleus still in place, the former much eroded.

Next day temperature 39° C.

Oct. 26th.—Much purulent discharge.

Oct. 27th.—Fundus oculi normal. Vomited during night.

Nov. 2d.—Temperature tends to range higher. Pulse 120. Discharge better in appearance. Severe frontal headache. Examination under anæsthesia showed no change in lateral sinus, and only normal granulations upon the dura. The dura on the inner side of sinus hyperæmic but smooth. No fistula on the inner wall of antrum or tympanum. Veins in the right fundus oculi appear somewhat distended.

Nov. 4th.—Restlessness, headache, no appetite.

Nov. 6th.—Very restless, vomits. Pulse somewhat irregular. No patellar reflex.

Nov. 8th.—Examination of the centrifugalized cerebrospinal fluid from a lumbar puncture showed no pus cells, no bacteria ; no growth on agar.

Nov. 10th.—Died comatose.

Autopsy.—At the bottom of the funnel-shaped wound two canals were found, one leading into the antrum and tympanum, and the other backwards to the saccus endolymphaticus. The blood vessels of the posterior fossa moderately distended and in the fossa a quantity of turbid serous fluid. Clot in the left sinus transversus. When the dura was stripped from the left petrous portion an oval opening was found in the posterior aspect of this bone as well as in the tegmen antri, and the dura at these points was covered with granulations and some pus. Nothing noteworthy on the inner surface of the dura. The pia of the base, including the medulla and pons and the extremities of the temporosphenoidal lobes, as far as the fossa of Sylvius was infiltrated, and covered with pus to the depth of several millimeters. The pia is translucent, and not œdematous. On the convexity the convolutions were found markedly flattened. The pia was congested and the vessels full of blood. In front on the left side there was some purulent infiltration. Both lateral ventricles distended especially on the left. They and the III ventricle contained yellowish turbid serum with a few flakes of pus. A small hemorrhage in the floor of the IV ventricle was also found. Pus in cochlea but the semicircular canals are free.

It is evident that the headache for which relief was sought was caused by meningitis, and for some time was the only symptom of that disease. The fact that no micro-organisms were found in the cerebro-spinal fluid did not rule out meningitis. The channel by which the infection reached the meningitis cannot be definitely stated, perhaps through the cochlea.

39. A true cholesteatoma in the posterior cranial fossa, infected in consequence of middle ear suppuration. Operation. Recovery.

This case has already been reported in this journal, volume xxvii., page 352.

40. Perisinuous abscess after acute mastoiditis. Optic neuritis, increasing after operation and most marked on the side opposite the disease.

F. R., æt thirteen and one-half, was brought to the clinic by his physician, Feb. 10th, 1901. About three weeks previously pain in both ears had begun without known cause. The pain on the right side persisted, but there was no suppuration. A week before admission there was swelling behind the right ear, and a few days after this there was unilateral headache, and some vomiting.

On admission, the sensorium is unaffected, the patient moves forward with some difficulty, and there is swelling and tenderness in and just below the mastoid region. The right drum membrane is injected, and somewhat bulging posteriorly. Whispers audible at 2½ meters. Pulse 112, temp. 38.9° C. No nystagmus. Puncture of drum membrane brought only a drop of blood.

Operation on mastoid Feb. 11th.—When the corticalis was cut away, pus flowed, and when the abscess was emptied, pulsating tissue was seen at the bottom of the opening. The lateral sinus and the dura in the neighborhood lay exposed at the bottom of the wound. The sinus was soft and easily compressible. The antrum was opened and its swollen mucous membrane exposed.

Next day, patient in good condition. Margins of optic papillæ somewhat obscured, especially on the nasal side. No œdema.

Feb. 12th.—Some headache. Left optic fundus shows beginning neuritis. Right eye, fundus somewhat hyperæmic.

Feb. 13th.—General condition good.

Feb. 15th.—Left optic neuritis well marked. Marked œdema of papilla. On right side there is only hyperæmia of the disk.

Feb. 18th.—General condition much improved. Left eye about the same. Right almost normal.

Feb. 27th.—The left optic neuritis has practically disappeared.

March 9th.—Wound behind the ear is healed and patient is discharged.

There was inflammation around the sinus, but no thrombosis. The fact that the general condition of the patient improved steadily caused the decision not to attempt any further operative work in spite of the optic neuritis and the fever lasting several days.

41. Extradural abscess without symptoms in a diabetic after acute meningitis. Operation. Recovery.

H. H., æt sixty-three, came to the clinic Jan. 29th, 1901. Dec. 31st previous, without known cause, patient was suddenly attacked with pain in right ear, and in four or five days suppuration began. Jan. 14th, the drum membrane was incised and the flow of pus increased. When admitted, there was much pus in the ear, but nothing abnormal about the mastoid region. He was put upon a strict diet. Fundus oculi normal.

Feb. 4th.—Pain in and around the ear. Undiminished flow of pus.

Operation, Feb. 5th.—Mastoid dense and hard. Antrum full of pus and granulations. Tegmen antri absent, so that dura lay bare. Between dura and bone a collection of about one dram of pus was found. Patient improved rapidly and went away in good condition, March 3d.

The only influence upon the amount of sugar in the urine which the operation appeared to have, was to cause a temporary diminution. The patient lost some weight, but felt better in general.

42. Extradural abscess in the posterior cranial fossa, with destruction of the sigmoid sinus from mastoiditis occurring in the course of typhoid fever.

Q. H., æt. nineteen. Typhoid fever, severe in type, began Sept. 4th, 1900, and during a relapse he began to have pain and deafness in the left ear. Suppuration soon ensued. At present his general condition is bad. Sensorium unaffected. Evening temperature, 38° C. Much thick pus in the left ear, and drum not completely visible. The superior wall of canal is bulging. The entire mastoid area is infiltrated and tender. Whisper audible at 30 *cm* on the left. Fundus oculi normal.

Operation, Jan. 13th.—Abscess, containing about one dram of pus, was found around the lateral sinus. This cavity was cleared out, and at one point the granulations were found to have destroyed the wall of the sinus, partly filling that vessel. The bleeding was free for a time, but was controlled by packing. The antrum contained no pus.

Jan. 20th.—First complete dressing of wound. Cerebellum pulsating, condition good.

Jan. 25th.—General condition good; wound closing rapidly.

Feb. 16th.—Wound closed.

Feb. 24th.—Discharged well. Hearing on both sides practically normal.

43. Embolic pneumonia after operative injury of the mastoid emissary vein. Recovery.

M. G., æt. twenty-one. Has been slightly deaf since age of four on account of aural suppuration after measles. Right drum membrane retracted, cicatricial and adherent to the promontory. On the left, the whole drum membrane is absent. Tympanic mucous membrane appears like epidermis. Hearing much diminished. Purulent discharge from this ear, for which syringing did not prove beneficial. Operation was thought to offer some hope of benefit to hearing by stopping suppuration.

Operation, May 1st, 1896.—The bone of the mastoid fossa was very sclerotic. The lateral sinus was displaced anteriorly. The emissary vein entering the sinus was very large, and was torn during operation, the bleeding being controlled by packing, and the rest of the operation had to be postponed. During the next four days the temperature was normal, but then the patient developed signs of pneumonia, and went through a somewhat irregular attack, lasting fourteen days. On the twenty-third day the operation was completed according to Stacke's method. Granulations in the attic, but none in antrum. The auditory canal was opened longitudinally posteriorly, and the wound treated by packing. In two and one half months the wound was healed, and hearing had much improved.

The rupture of the emissary vein evidently was the starting point of a thrombosis which became septic, and gave rise to an embolic pneumonia of an irregular type. The case shows that the tearing of a small vein opening into a sinus is not so harmless as might be supposed, considering the size of the vessel.

REPORT ON THE MEETING OF THE NEW YORK OTOLOGICAL SOCIETY OF MAY 28, 1901.

BY H. A. ALDERTON, M.D., SECRETARY.

President HERMAN KNAPP, M.D., in the chair.

Dr. ROBERT LEWIS, Jr., presented **a case of temporo-sphenoidal abscess.**

R. C.—was admitted to the New York Eye and Ear Infirmary on the 23d of January, 1901, and from her and her friends the following history was obtained. Since her childhood (the patient is now twenty-three years of age) she has had an almost constant purulent discharge from the left ear. Ten months ago, during the cessation of the discharge, she complained of pain in the ear. An ice-coil was applied by her physician and the pain subsided with a return of the otorrhœa. The present attack began on Sunday, January 13th, with a "cold." On January 14th, she had some earache and tinnitus, headache on the side of head affected, no dizziness, no vomiting, and the discharge stopped. Patient kept growing worse and on Thursday, January 17th, complained of chilly sensations and of pain in her back. Her medical attendant made a diagnosis of the "grippe." January 18th the patient had a severe chill, which lasted twenty minutes, her teeth chattered and she shook convulsively; temperature rose to 104 ° F. but was not followed by perspiration. She had violent headache on the left side, the pain extending to the neck; however, the mobility of the neck was normal. Some vomiting (not projectile). Saturday, January 19th, 1 P.M., the patient had a chill lasting eight minutes, followed by a rise of temperature and sweating, with much exhaustion. A second chill at 7 P.M. which lasted twenty minutes. January 23d, she had another severe chill lasting twenty minutes, followed by fever and sweating, muttering delirium and a tendency to drowsiness. January 22d, a slight left facial paralysis was noticed; no chill on this day but the patient was very weak. Amnesic aphasia appeared on this day, drowsiness more marked, answered questions rationally but very slowly, no convulsions at any time, and no slowing of the pulse. She used the word "fan," indiscriminately, calling her physician Dr. "Fan," her coat "fan," etc. On January 23d, L. saw her for the first time, on her admission to the hospital. The physical examination showed mastoid to be slightly tender over the antrum, the tip, and the emissary vein; no œdema over the mastoid; a profuse and foul discharge from the auditory canal; a furuncle upon the posterior cartilaginous wall; no tenderness in the neck nor did the jugular vein seem to be thrombosed; no ocular paralysis; a slight general anæsthesia, though no difference between the two sides; knee-jerk normal; temperature 103½° F., pulse 108, respiration 24. **Diagnosis:** *Mastoiditis, Cerebral Abscess.* She was prepared for operation. **Operation:** The usual curvilinear incision was carried forward so as to expose the entire squamous plate of the temporal bone, a third incision was carried from the curvilinear incision at the top of its curve, upwards and backwards. The mastoid cortex was normal in appearance and of an ivory-like hardness; on opening the antrum a very foul smelling discharge appeared. The antrum was very large and filled with cholesteatomatous material. Bone necrosis extended downwards to the tip, backwards so as to include the sinus wall; the sinus was exposed for about an inch and was covered with a foul-smelling pus and with granulations. The pus kept oozing out of the vicinity of the antrum and on exploring with a probe it passed through the tegmen tympani and entered the cranial cavity some distance. On its removal a tablespoonful of thin foul-smelling pus flowed out. The posterior and upper canal-wall was removed and the tympanic cavity was cleaned out. Then the whole of the squamous portion of the temporal bone and some of the anterior inferior angle of the parietal bone was removed. The exposed dura was blackish in spots and everywhere covered with lymph and bathed in pus. This extradural abscess was situated fairly far forward and covered over the temporo-sphenoidal lobe. The brain pressure was plus over the temporo-sphenoidal lobe. The scalpel was passed directly into the brain at this point and the incision carried upward and forward about three-quarters of an inch. Some disintegrated brain material and pus escaped. The size of the cavity was about that of a walnut and was lined with a membrane. The cavity was not irrigated but cleansed with pledgets of gauze. An annoying hemorrhage occurred from one of the meningeal vessels. Sterile gauze packing used. The posterior incision as well as the third incision was closed with sutures. Firm pressure by means of the dressings and bandages was applied. The extradural abscess was walled off by adhesive inflammation from the healthy dura. The operation lasted one hour and fifteen minutes, and was followed by little or no shock to the patient. The temperature following the operation was $98\frac{4}{10}$° F., pulse 100, good and strong. During convalescence the temperature never went above 100° F. and never below 98° F. During the week following, the patient was restless, at times noisy, and had retention of urine. January 26th, facial paralysis hardly discernible. The aphasia somewhat better; complained of much headache; when the wound was dressed no irrigation was used but the cavity wiped out with cotton pledgets soaked in weak bichloride solutions, and the wound packed with sterile gauze. The wound was dressed every other day. On February 20th the aphasia had entirely disappeared. On March 7th a small abscess developed in the anterior extremity of the wound. Patient was etherized and incision made over the point of fluctuation and a discharge of pus followed, and, on probing, a small point of necrosed bone was found. This was removed with the rongeur and curette. Patient was discharged from the hospital on March 21st. By the middle of April, epidermization of the tympanic cavity had taken place; the external wound had healed some time previously. A little discharge still persists, coming from a small granulation in the vicinity of the Eustachian tube. The patient's physical condition was never better.

Discussion.—Dr. Toeplitz questioned as to the advisability of doing a radical operation at the time of operating for the abscess; right from the start. Dr. Whiting asked if the incision into the brain penetrated deeply into the cortex? Dr. Lewis: Only very superficially, under the dura. Dr. Whiting thought it might have been an abscess caused by erosion of the superficies of the cortex. Dr. Kipp asked whether the abscess was in the temporo-sphenoidal lobe? Dr. Lewis: Yes, in the brain tissue. Dr. Gruening: Amnesic aphasia does not always mean that we have to do with an abscess of the brain. Mentioned a case in confirmation. Dr. Knapp: There may be aphasia without any abscess of the temporal lobe; without any purulent process. Embolism may produce such a condition. Dr. McKERNON asked as to the color of the dura in Dr. Lewis' case? Dr. LEWIS: Dark reddish. Dr. Mc KERNON: Did this discoloration extend very far? Dr. LEWIS: Quite far. Dr. McKERNON spoke of a case illustrating dark discoloration of the dura.

Dr. ALDERTON presented **an improved canula for washing out the mastoid antrum.**

Discussion.—Dr. GRUENING spoke of a case of O. M. P. C., following scarlet fever in childhood, on which a radical operation was done. The ossicles were found to be healthy, the suppuration being only in the antrum of the mastoid. Dr. KIPP had a case of attic disease under observation for twenty (20) years, following scarlet fever. There was a perforation through Schrapnell's membrane. At numerous times there had been symptoms of retention, but the patient recovered without operation. Finally, the perforation enlarged, and the neck of the hammer was exposed, showing superficial caries. Cure followed. Dr. ALDERTON: The canula is only designed to be used after ossiculectomy.

Dr. J. L. ADAMS **reported a case of abscess of the temporosphenoidal lobe.**

Discussion.—Dr. WHITING: I saw the case reported by Dr. Adams. The nurse said the patient had a staggering gait. The patient had trismus, pronounced yawning, double neuro-retinitis. He believed it to be a case of abscess of the cerebellum, but recommended exposure of the temporo-sphenoidal lobe, as pressure from an abscess in this region might have induced all the symptoms complained of. Dr. KIPP asked whether there was neuritis or neuro-retinitis? Dr. WHITING: Patient had neuroretinitis with numerous hemorrhages and patches of exudation, and had also paralysis of sixth nerve of left eye. Dr. KIPP: In cases of choked disc, the retina is not usually involved, and the sight is usually recovered.

Dr. MARPLE reported **a case of mastoiditis, in a child, with excessive œdema of the eye-lids.** Boy, age nine years, with left acute otitis media purulenta following scarlet fever. *Mt* had been incised freely twice. Subsequently mastoid œdema and redness with marked tenderness on pressure, appeared. A mastoid operation was done. A very deep-lying antrum was opened, containing no pus, and hardly any granulation tissue.

Next day, some trifling œdema of eye-lids, which increased the following day. There was apparent fluctuation in front of the auricle, and a counter-opening was made here, but no pus was found. Drainage. The following day, 3rd day after operation, the patient was seen in consultation by Dr. Whiting. There was swelling of the tissues over the temple, and the swelling of the eye-lids was so great that it was almost impossible to press the lids far enough open to get a view of the fundus. Dr. Whiting found a spot of osteomyelitis a little in front of and above the auricle in the squama. This spot was cleaned out with curette and rongeur. The œdema rapidly disappeared, and the patient made an uninterrupted recovery.

Discussion.—Dr. GRUENING asked what the condition of the ear was? Dr. MARPLE: O. M. P. following scarlet fever. Dr. GRUENING: Œdema of the eye is very common, in children, with mastoid disease. It sometimes occurs when sutures are used in the upper angle of the operative wound. Thinks that we should not use sutures in infective mastoiditis. Dr. H. KNAPP: Was there exophthalmos? Dr. MARPLE: No. Dr. KIPP stated that in Zaufal's clinic they were in the habit of suturing the operative wound completely. Dr. GRUENING: But his assistants state that they are frequently compelled to re-open.

Dr. QUINLAN reported **case of mastoiditis, with intracranial complications,** sinus accidentally opened.

Discussion.—Dr. BACON asked whether there was any pain on pressure over mastoid. Dr. QUINLAN: Not until œdema developed, then over the emissary vein and tip. Dr. BACON: That point of absence of pain in sclerosed conditions should be emphasized. He has operated on such cases, the only indication being the presence of profuse discharge.

Dr. GRUENING reported **a case of mastoiditis complicated by erysipelas.** Has operated thirty-two times in the Mt. Sinai Hospital, and had erysipelas develop four times. Asked whether such frequency is noted in special hospitals. All the cases recovered. The first case was a private one, not in touch with the other patients; a little child. It first affected ear and face without touching the scalp. Last case, also private, remained in isolating house four weeks. Temperature varied between subnormal and 106° F., a difference of 9° in twenty-four hours. The patient felt well all the time.

Discussion.—Dr. KIPP had operated in one case of mastoiditis while erysipelas was also present, and the case did well. Dr. GRUENING: That was the case with one of my patients. Dr. EMERSON : Some years ago the Manhattan Eye and Ear Hospital had an epidemic of erysipelas. On investigation as to the possible cause, it was found that there were a number of ventilators filled with dust. These ventilators were cleaned out and the epidemic disappeared. Drs. J. L. ADAMS and MC KERNON spoke of the occurrence of erysipelas at the New York Eye and Ear Infirmary. Dr. GRUENING thought that the larger operative field at present might have something to do with the greater frequency of erysipelas. Dr. DUANE stated that the New York Hospital had had an epidemic of erysipelas, and they had finally traced it to the ventilators. Dr. BACON stated that at the N. Y. Infirmary the peculiarity was that the cases broke out in one corner of the ward. Dr. H. KNAPP in his last thirty-two cases of mastoid operation had no erysipelas. A few in former years.

Dr. C. J. KIPP reported a case of **acute otitis media, with thrombosis of the lateral sinus. Recovery after removal of thrombus, without ligation of internal jugular vein.** A woman, about forty-five years of age, had an otitis of about five weeks' duration with profuse discharge and great pain in mastoid region. Posterior superior wall of canal red and much swollen. The antrum was found filled with pus and granulations. A fistula extended towards the lateral sinus, the bony covering of which was discolored. On removal of this, the lower part of the sigmoid sinus was found to be of a yellowish color, not unlike wet leather, while near the knee it was nearly normal in appearance. Incision of the sinus caused escape of a considerable quantity of purulent fluid ; near the knee a disintegrated thrombus filled the sinus. After the removal of the thrombus, with a sharp spoon, there was free bleeding, which was stopped by pressure. From the lower end of the sinus a good deal of purulent matter was removed, with spoon, but all efforts to establish communication with the bulb were futile. Careful palpation of region of internal jugular vein showed this to be normal. The discolored outer wall of the sinus was not cut away, but the sinus tamponed with iodoform gauze. The internal jugular was *not* ligated as the patient showed signs of faintness. For a week after the operation the temperature ranged between 99° and 100°. After that it gradually rose to 103° in the evenings. At same time the patient complained of pain in right gluteal region and on examination a large abscess was found here. After opening of abscess, the temperature fell to normal and remained so. Since then the patient has had no further trouble. The wound closed entirely in about two months and the patient is now in perfect health. The case is thought worth reporting, as it shows that recovery can take place without ligation of internal jugular vein in a case in which the sinus contained fluid pus and a thrombus, presumably infected by contact with the purulent fluid, occluded the sinus near the bulb. It also shows that resection of the disintegrated walls of the sinus is not always essential to speedy recovery. That the development of the gluteal abscess would have been prevented by the ligation of the jugular or the excision of the diseased wall of the sinus is not probable.

Dr. GORHAM BACON reported a case of **epileptiform attacks with O.M.P.C.** W. C. M., thirty-five years old, married. Seen April 22, 1901. Has been on stage fifteen years. Had scarlet fever eight or ten years ago. Deaf in right ear. Patient is strong and robust in health. First had an attack with loss of consciousness thirteen years ago, repeated regularly every thirty days afterwards. These attacks have been fairly constant ever since. The longest interval has been six weeks. On one occasion had three in one day, one right after the other. Usually nocturnal. No cry, had bitten tongue. Is first blue, then pale ; rigid, then limp. Afterwards sleepy, nauseated and without appetite. No headache. Slight twitching of the right eyelid. Hearing: Watch, R. ear one-half inch, L. ear one inch. Bone-conduction increased on right side. Galton whistle: highest notes not heard at all, other notes close to ear, with right ear; highest notes not heard at all with left ear, others heard fairly well. Raised voice heard fifteen feet by left ear. Discharge from right ear, thick and offensive, the same in character for some years. Right canal somewhat contracted. No landmarks can be made out. Evidently a perforation in Schrapnell's membrane, as probe passes into attic and touches carious bone. Left *Mt* dull and retracted. A year ago the patient had the ossicles removed. Discharge was less for a short time but soon reappeared. May 1st, Schwartze—Stacke operation performed. May 23d, wound closed behind auricle; very little discharge from middle ear. He had a slight attack on the 19th ; the interval being six weeks this time instead of thirty days and the attack being less severe.

Discussion.—Dr. MCKERNON spoke of a similar case,—one of

O.M.P.C. An ossiculectomy was done. No epileptiform attack since. Dr. KNAPP: How long since last attack? Dr. McKERNON: None since March, 1900.

Dr. WHITING spoke of **a new method of dressing mastoid wounds.**—Has been impressed by the great pain experienced by patients at the first dressing. He has completely solved the problem of rendering it painless. He takes, after the completion of the bone operation, a piece of rubber tissue, six inches square, perforated with numerous holes. This is applied to the wound, packed full of gauze, and the other dressings placed as usual. There is no adhesion at the first dressing and no pain. No unfavorable complication has developed so far. The relief is extremely gratifying. The rubber tissue is kept in a solution of bichloride.

Discussion.—Dr. GRUENING: This pain is certainly present with the dry dressing but is not present with the moist, covered with rubber tissue externally. The moist dressings also drain better, but it is necessary to change them every day,—yet mastoid wounds should be dressed every day. We should not leave the pus in contact with the wound so long as two or more days. Thinks Dr. Whiting's method is a great improvement. Dr. J. L. ADAMS asked how the poulticing effect from the rubber tissue was avoided. Dr. GRUENING: It is a poultice, but acts very favorably and the skin is not affected. Dr. ADAMS: How long is it before the first dressing, and how do the granulations look? Dr. WHITING: The first dressing is made from the second to the sixth day. Not very much granulation tissue shows at the first dressing. The tissue looks a little blanched. Dr. J. L. ADAMS asked whether there was any fluid between the rubber tissue and the wound surface. Dr. WHITING: No, the fluid escapes through the fenestrations. Dr. E. B. DENCH: Dr. Halstead had used this method in all bone cavities, from operation, for many years. Dr. WHITING said that he did not claim originality. Dr. H. KNAPP: Don't we remove our dressings too soon? Macewen sometimes leaves the first dressing eleven days and then its removal is not painful. To do it on the second day is very painful. Dr. WHITING asked whether Dr. Gruening had used silkworm-gut as suture material. He had used it without the development of stitch abscesses. Dr. KIPP had the same result. Dr. GRUENING prefers silver sutures, but has given up all suturing. Dr. DENCH spoke in favor of perfectly sterile catgut, which acts beautifully. Dr. GRUENING thought it must be very difficult to sterilize catgut. Dr. DENCH said he used the dry method.

Present:—Drs. Hepburn, H. Knapp, McKernon, Whiting, Duane, Gruening, Kipp, Toeplitz, Emerson, Lewis, Quinlan, Marple, J. L. Adams, Bacon, Dench, and Alderton.

REPORT OF THE SECTION ON OTOLOGY, OF THE NEW YORK ACADEMY OF MEDICINE.

By Dr. ROBERT C. MYLES, Secretary.

President, JAMES F. MCKERNON, M.D., in the Chair.

STATED MEETING HELD OCTOBER 9, 1901.

A new Eustachian catheter curve. Dr. GEORGE B. MCAULIFFE presented this instrument and demonstrated its use upon a patient. He had been experimenting with it during the past six months and he was satisfied that it fulfilled a want in certain cases. Instead of the angle being in the end of the curve, it was distributed along the curve of the instrument. It was specially suitable in those patients who had wide nares. The instrument is passed directly into the tube after traversing the outer part of the floor. As it passes along the outer portion of the floor the septum shoves the catheter right into the Eustachian tube, in the last movement of catheterization.

Presentation of a patient showing extensive thrombosis of the lateral sinus, with reinfection following a chronic suppurative otitis; ligation of the internal jugular vein. Dr. M. D. LEDERMAN presented this patient.

F. R., seventeen years of age, was admitted August 9, 1901, to the Manhattan Eye and Ear Hospital, with symptoms of a septic nature. He gave a history of having had a running ear for ten years, which later improved. A week ago he was struck a blow over the right ear, which caused a blood discharge for two days. There was tenderness over the mastoid, with a temperature of 100.8° F.; pulse 84.

Examination revealed an old suppurative otitis, with the membrane almost entirely absorbed, and some odoriferous pus in the middle ear. Antiseptic douching every three hours with the Leiter's coil was the treatment carried out for twenty-four hours.

The next day the patient complained of some pain over the side of the head. The ice coil was discontinued so as not to mask symptoms, as there was a previous history of irregular suppuration.

A distinct chill of severe character attacked the young man with the usual symptoms of a septic involvement of the sinus. The skin was quite moist, of a peculiar sallow appearance, and tongue heavily furred.

The first operation was performed August 12th. On opening the mastoid, not much pus was found in the antrum, but considerable granulation tissue was removed. Diseased bone was curetted from around the sinus, and the vessel was incised from the knee to the jugular bulb. A septic thrombus was found, and the lumen of the sinus was cleansed until a free bleeding showed that the posterior opening was patent. No return flow followed the use of the curette through the lower end of the sinus (the jugular bulb), so the jugular was tied about two inches from the clavicle. No disease of the vein in this region could be detected, so no attempt at its resection was made. As soon as the ligature was applied it immediately filled with blood, permitting the belief that a free circulation was being carried out through the tributaries.

The patient did well for two days, with a slight rise of temperature, and the first dressing was made August 14th. The neck wound was found clean, but the antrum opening showed some pus; the sinus seemed to be doing nicely. Thought advisable to cleanse the antrum site, and so employed the curette until a clean return of fluid through the external canal after syringing revealed that the drainage was good. The temperature remained around 99° F. for five days, then suddenly arose to 105° F.

On August 17th we found some pus in the region of the jugular bulb, and I removed the bone surrounding this area, but found nothing but a little pus, which did not lead to any pocket. The wound was then dressed daily, and it was noticed that the temperature fluctuated, with an occasional chill, indicating sepsis in a severe form. On August 27th a purulent discharge was observed coming from the posterior opening of the sinus. The patient was again narcotized for the third time, and the external bony wall of the sinus was removed to near the torcular. An incision was made to the end of the bone wound, through the sinus, and the infected thrombus was curetted away. The wound was then douched with bichloride and the entire wound dressed. The antrum wound was packed separately.

From this treatment the temperature gradually decreased to 99° F., and the patient rapidly improved.

The infection evidently occurred from the antrum, as this portion of the sinus had been thoroughly cleansed at the first operation.

Discussion.—Dr. EDWARD B. DENCH thought that the cardinal point which should always be followed, no matter whether the vein fills up or not, should be to ligate the tributary branches in these cases and then to resect the vein from a point in the neck as low down as possible to a point as high up as possible. He thought that the constitutional effects might possibly have been avoided if complete resection of the vein, with ligation of the tributary branches, had been done. A pet point with him was the thorough packing of the sinus wound from the antrum so as to prevent infection from the original site. Dr. LEDERMAN answered that it was packed off. Dr. DENCH did not believe that such a condition of affairs could ever occur if both the antrum and sinus were packed off and a firm gauze packing inserted between so as to isolate the two fields. The outcome of the case presented, he thought to be very satisfactory and there would be but little scarring left in the neck. Aside from the advice as to complete resection of the vein, he had nothing to add.

Dr. MCAULIFFE asked if the condition was due to traumatism, or was it a sequel of an ordinary catarrh? This same case had been under his and Dr. Whiting's observation during a period of four or five months, and then the symptoms were those of an ordinary otitis media, without any mastoid development. He thought that after he had passed into Dr. Lederman's hand traumatism had become a causal factor.

Dr. WENDELL C. PHILLIPS said that, in this connection, he was reminded of a recent experience of his own occurring in a case that manifested one of the symptoms implied in this case, *i. e.*, from traumatism, which case he would report at a later meeting. In this case there was no sinus involvement, but he came to the hospital some time during the following spring with all the signs of cerebral involvement and, at the same time, with a chronic suppuration of the middle ear; so it was natural to presume that the cerebral involvement was due to the middle-ear trouble. He was operated upon and the mastoid bone was found to be extensively involved, as also was the petrous portion of the temporal bone. Later this patient died of a pachymeningitis. No place was found where infection could travel from the mastoid into the brain. After a few days it was learned that the child had received a severe blow upon the head. He was still at a loss to know what was exactly the real cause of the pachymeningitis.

Dr. **Thomas J. Harris** was present at the performance of the first operation upon this man. He was particularly interested in what had been reported as re-infection, and he was not perfectly clear in his own mind as to the cause of it. He believed there had been complete establishment of the flow from the torcular, and he had urged the operator to still farther introduce the curette to get a more perfect flow, until there was really a torrent of blood flowing from the field. The antrum was packed off from the lateral sinus and, in spite of all this, re-infection presented itself in some—to him—unaccountable way.

Dr. **Dench** said that it seemed to him that the re-infection probably occurred from the same side because the tributary branches had not been tied off.

Dr. **Lederman** felt certain that re-infection did not come from omitting to tie off the tributary branches, but came directly from the antrum, as pus was noticed in the antrum at the first dressing. The antrum was thoroughly curetted again, and packed separately. The jugular vein immediately filled when the ligature was tied, which showed that free circulation was present. Furthermore, after the removal of the septic clot from the posterior wound of the sinus, near the torcular, the septic temperature disappeared, proving conclusively that this site was causing the trouble, and not the tributary circulation, as the neck and bulb wounds were clean and healing rapidly.

He has had a little experience with these cases, five in number, three of which recovered. In these three he did not attempt to tie off the communicating tributary branches, but in the other two he did.

In manipulating the probe and curette we were likely to spread infection, unless gentleness and caution were practised. He remembered one case in which he had syringed out the lower end of the jugular through the neck wound, removing a long clot in this manner, after failure to dislodge same by syringing from the bulb downward. Twelve days after, there appeared a large swelling in the neck, which was thought to be the result of an infection, but was found to be a periphlebitis. After tying off four or five tributaries the size of the thumb, the patient made a good recovery. In the case just presented, the infection came from the antrum and not from the collateral veins. This case shows how quickly the wounds heal at times, and furthermore emphasizes the importance of removing all diseased tissue.

It is not possible to determine microscopically the extent of the infectious process.

Dr. EDWARD B. DENCH thought the discussion of the subject was too important to be discontinued. He remembered one case in which the vein was involved but could not be dissected out because the walls were very soft; in that case the vein filled perfectly after the ligature had been applied below. The tributaries were tied off and the infected vein left in situ and the patient made a smooth recovery. The mere fact of the vein filling after the ligature had been applied, did not, in his opinion, mean that there might not be still danger from infection. He insisted upon the necessity of tying off the tributaries, for infection may extend from the antrum into the sinus and through the tributaries into the general systemic circulation.

Dr. LEDERMAN did not mean that re-infection took place from the other side of the torcular as suggested by Dr. Dench; it occurred from the same side from continuity of tissue, as the gauze was soiled from the antrum packing. The subsequent history of the case proved conclusively that the septic temperature and symptoms arose from the re-infection of the posterior sinus wound, and not from any sepsis in the tributary circulations. Immediately after the third operation (*i. e.*, the removal of the external bony wall of the sinus to near the torcular, and an incision through the vessel itself, with a thorough curetting of the diseased contents, until a free bleeding showed that the channel was clear), the temperature returned to the normal limit, and so remained.

Dr. JAS. F. MCKERNON remembered the case referred to by Dr. Dench and also two other cases in which the vein collapsed and later filled up completely; when the facial and maxillary veins were removed they were found to contain thrombi at least one and a half inches in length. He thought that it would be better to dissect out the internal jugular after ligation and remove its tributaries, first ligating them, and look for diseased glands in the vicinity, rather than to ligate that vessel and allow it to remain as a possible source of future infection.

Dr. Frederick Whiting said he would like to supplement the remarks of the preceding gentlemen. He believed that the only safe course was to tie off the branches that took part in the collateral circulation, dissecting them as low down as possible. He had removed a considerable number and had defined the limits of the clot, and, after cutting off the veins far below the clot, had subjected the walls of them to a microscopical examination and had found them infiltrated with streptococci. The visible boundaries of a clot offer no assurance that infection ceases at that point.

Symptoms pointing to the necessity for operative interference in mastoid suppurations.

Dr. Wendell C. Phillips read this paper. In selecting the time for operative interference in mastoid complications of suppurative middle-ear disease, the judgment of the operator is often subjected to a severe test, and the object of the paper was to endeavor to outline those symptoms which may be looked upon as pointing to the necessity for operative interference. For convenience of description he divided the topic into acute and chronic mastoid suppuration.

Acute suppurative mastoiditis.—In all grippe cases a large amount of infectious material is present, the most characteristic of which are the streptococci, the staphylococci, and the pneumococci, in the nose and naso-pharynx. The accompanying inflammation and tumefaction of all the intranasal tissues so obstruct the nasal channels that ordinary blowing of the nose is attended with more or less danger, for some of the infection may enter the Eustachian tube and become the exciting cause of acute middle-ear suppuration, which is peculiarly violent, virulent, and rapidly destructive to all tissues with which it comes in contact. It should be the routine practice to make microscopical examinations of the pus in all acute cases of middle-ear suppuration, and if streptococci or staphylococci are present, we then know the tendency to mastoid involvement is much greater than otherwise. Where general infection is suspected, blood examination also should be made. Other things being equal, knowing the rapidity of the destructive nature of the pus, with its tendency to migrate into tissues far beyond the confines of the middle ear, would lead us to operate early.

Probably the most marked symptom during the course of an acute suppuration of the middle ear showing involvement of the mastoid is pain, occurring some time after the excruciating pain preceding the suppuration has passed away. This pain is dull, heavy, not definitely localized but diffused over the surface of the temple. With it there is a feeling of fulness, heaviness, and pressure over the entire parietal region. The pain may or may not be constant. Another prominent symptom is tenderness upon pressure, usually marked at the tip of the mastoid, but is more significant if it is higher up over the mastoid antrum ; the mastoid tip may be tender on pressure even when there is no disease present. Temperature also has been considered, but it has no very important symptom in mastoid involvement. Facial expression has been emphasized, but it rather indicates anxiety. The head usually hangs forward and leans toward the healthy side. External periostitis with or without cutaneous infiltration has also been considered as a symptom, although, as a rule, operative interference should be resorted to long before these symptoms appear. When present it is more a complication than a symptom. When the drum membrane, together with the posterior-superior portion of the wall of the canal, is found to be bulging downward and forward into the canal, a picture is given which constitutes one of the most prominent symptoms of mastoid suppuration. Prolonged tenderness upon pressure over the region of the antrum, together with the bulging described, gives sufficient reason for operative interference, especially so when the pus contains streptococci or staphylococci. Symptoms of other complications the speaker simply referred to, such as rigors, vomiting, vertigo, choked disc, aphasia, paralysis of the extremities, high temperature, facial paralysis, dulled mentality, uneven pupils, the so-called typhoid condition, etc. All of these symptoms indicate that the suppurative process has gone beyond the mastoid cells into either the lateral sinus, the dura, the cerebrum, or the cerebellum. It may be possible to have a non-suppurative involvement of the mastoid cells, a mere congestion, but such a condition is exceptional.

After briefly discussing the treatment of acute purulent otitis media, Dr. Phillips continued by saying that any prolonged attempts at aborting mastoid involvement was to be deprecated. He emphasized the importance of placing the patient in bed and keeping him there until all symptoms had passed away. It was especially in the grippe cases that we should not delay operative interference. The method of operating should carry out this one prime factor, namely, that all diseased tissue should be removed.

Chronic mastoid suppuration.—Long-delayed suppuration of the middle-ear, attended with involvement of the attic and probably the antrum and mastoid cells, may lead to the necessity for external operation in order to overcome the suppurative process. This is especially true in cases of chronic otorrhœa, the discharge of which is offensive, and with the establishment of cholesteatomatous masses and carious bone. Only by an external operation, in many instances, may we hope for permanent relief. That a chronic otorrhœa is attended with more or less danger to life will not be denied, and to-day life-insurance companies absolutely refuse to accept as risks persons who suffer from a chronic discharge of the ear. An attempt should be made to cure permanently all cases of chronic otorrhœa. Local measures, removal of the necrosed ossicles, and of other known methods should be made use of before resorting to external operation.

Dr. Edward B. Dench was heartily in accord with everything said by Dr. Phillips with the exception of one point, *i. e.*, that we should operate earlier in some cases. He believed that an exploratory operation was perfectly justifiable ; it did not make any difference whether one did an exploratory mastoidotomy or an exploratory laparotomy so far as the risks were concerned. Dr. Phillips said that we should not operate until we made sure of the diagnosis, but he had to confess that there were many cases in which he could not make a diagnosis until he had opened up the bone.

In a certain proportion of cases, about the only symptom which would lead to proper treatment is emaciation of the patient, and the symptoms of a mild but progressive sepsis. He remembered a case in which the drainage seemed to be free, and there was a slight swelling of the deep part of the canal. At the same time the child progressively lost flesh and always had some temperature. He saw the case late one night and, taking the temperature of the child, the history, and the general appearance into consideration, insisted upon immediate operation, much to the disgust of his colleagues. He found the mastoid completely broken down. The child made a rapid recovery.

Dr. Dench referred to another case which will be reported in detail at a later period. This patient had had certain symptoms of mastoiditis, and when he saw the case the acute symptoms had passed off. As there was no evidence of mastoid trouble present when he saw the patient he was inclined to discredit the history previously given, and he thought there must have been some mistake. He thought the patient might have had a furuncle in the canal. This patient was not under observation except at very irregular intervals. Three months later he operated and found the mastoid broken down, which showed that the mastoid operation had been indicated three months previously.

He agreed with Dr. Phillips that it was not right to subject the patient to operation simply because it did no harm. But, on the other hand he believed that, under the usual aseptic precautions, mastoid operations were devoid of danger, as much so as a simple incision through the membrana tympani. He thought it was our duty to our patients to make an exploratory incision early, which would not only clear up the diagnosis but would also hasten the recovery from the acute suppurative process. In not one instance had he ever seen hearing impaired when the mastoid operation had been performed early ; this is not so when suppurative otitis media runs a long course. In cases where the operation is performed early, when there is but slight involvement, the function of hearing is restored to the normal standard and there is a shorter convalescence from the effects of the systemic infection. Therefore he was an advocate of the early operation.

Dr. M. D. Lederman said that he inferred from the remarks of the last speaker and the reader of the paper that the rule should be to operate when in doubt, and he deemed that to be a good rule to follow, especially in acute cases. Following the attacks of grippe there seemed to be a distinct and definite form of infection in the majority of instances where tenderness persisted even after free drainage and cleansing; in those cases we often find the antrum a reservoir of pus and extensive destruction of bone in the mastoid. He detailed two cases in illustration.

Dr. Thomas J. Harris said that Dr. Phillips's able paper seemed to have brought about a discussion of early operative interference. He wished that Dr. Dench would again speak and inform his hearers more definitely what he considered the indications for early operative interference, and when he would operate.

Dr. Dench, in replying, said that chronic suppurations did not, in the majority of cases, involve the mastoid. If we opened the mastoid in every case, irrespective of the symptoms, we would find healthy bone in many of these cases. Regarding the question "when to operate in cases presenting symptoms of mastoiditis," that was very difficult to answer. Dr. Woods, before the Otological Section of the American Medical Association, reported three cases in which a late mastoid operation was necessary. Where there was an affection of the mastoid cells, due to purulent infection, he believed that the disease might lie quiescent for a few days, weeks, or even years, but he did not believe that the patient could recover without operative interference.

Regarding the indications for operative interference, he considered of importance persistent local tenderness; also, slight temperature in cases of otitis with previous acute symptoms; also, slightest evidences of systemic infection; also, the presence of leucocytosis.

Dr. ROBERT C. MYLES said that one, after looking over the ancient literature on this subject, would undoubtedly believe that men had been too conservative. He thought that it was by properly defining these symptoms, and acting intelligently and promptly, that we could avert from our patients the dangers of intracranial infection. It was very interesting indeed to note that a large proportion of the cases had recovered without operative intervention. The position held by Dr. Dench, he thought, was assumed by all: the early operative course, in many cases, is partly exploratory, because we are not absolutely certain concerning the pathological condition within the cavities.

Dr. MCAULIFFE said that there was a tendency to deprecate the diagnostic point of tip tenderness. He emphasized that this became the prominent symptom when there was a more or less direct communication between antrum and tip as seen in dry anatomical specimens; that tension was relieved by the discharge penetrating into the tip, and the latter became the principal focus of inflammatory symptoms. With tip tenderness and one or two of the other symptoms present, such as persistent discharge, etc., we will always find caries in the mastoid cells. There are many men who boast that they open the mastoid, and never find that they have done so too quickly, and they always seem to be able to find disease present. He said that some content themselves by finding pus in the antrum, whereas in 95 per cent. of ordinary purulent otitis media pus could be found in the antrum. This statement does not place me among the conservatives, for I believe in radicalism in mastoid surgery.

Dr. PHILLIPS (closing the discussion) said that he too would like to emphasize the point referred to by Dr. Dench. One would not be safe in saying that, in mastoid cases, operation was not necessary because there was a free discharge from the middle ear; the most extensive involvement was often found when the pus was welling from the middle ear. Regarding the exploratory incision, he was not yet ready to change his views, nor had Dr. Dench convinced him that his views on this subject were wrong. Even Dr. Dench's statement goes far to prove his contention, for he said that during the past season he had never made such an exploratory operation without finding pus. He had thus really made his diagnosis previous to making his so-called exploratory incision, and in every instance had found pus. He had frankly stated that the operation when done carefully and under proper precautions was without danger. A strong point in favor of opening the cells early was that the hearing results were far better.

He thought that Dr. McAuliffe believed in the abortive treatment more than many others. Some five or ten years ago, at the Manhattan Eye and Ear Hospital, no case was ever operated upon until attempts had been made to abort. Gradually that plan subsided and now the majority of cases are at once taken into the operating room. This was done because most cases had already reached the operating stage before applying for treatment.

Regarding the tip tenderness he did not mean to say that it was not important.

A conservative element in acute mastoid surgery.

Dr. EDWIN W. PYLE read this paper, detailing an interesting experience respecting a case of acute mastoiditis following scarlet fever. The parents refused operation and under the influence of hot douching the patient made an excellent recovery, 2 years afterwards having a slight tinnitus and a hearing distance of 20″. The indications for operation were too pronounced to teach conservatism under similar conditions but illustrate that we don't always know what "might have been." Dr. Pyle's paper was a spirited plea for conservative methods of treatment in acute tympano-mastoiditis. He gave statistics from 25 physicians in general practice throughout the country to show how seldom mastoiditis needs operation. This statement was verified by his personal experience of 25 years in general practice and 4 years in special work.

The paper was discussed by Drs. Phillips, Dench, Whiting Mayerhof, Wilson, McKernon, and, in reply, by Dr. Pyle.

STATED MEETING, HELD NOVEMBER 13, 1901.

A new mastoid bandage.

Dr. GEORGE B. MCAULIFFE: When patients leave the hospital after ordinary mastoid operations have been performed upon them, I have found that they always have an aversion to going out with the white gauze bandage, on account of its conspicuousness. They invariably covered the dressing with a black silk handkerchief. I did not see why a black gauze bandage would not be practicable. Therefore, Seabury and Johnson have made a black gauze bandage which answers all the requirements of the white bandage in its properties as a dressing and is not discolored by any discharge. I know nothing regarding the preparation of this bandage, but I know that, when soaked in water, the color remains fast.

A new ear syringe.

Dr. JAMES F. MCKERNON: I wish to present to the Section an aseptic ear syringe, one that can be taken apart and thoroughly sterilized. It has a solid piston. Tieman and Co. are making it now, although it was originally made in Pittsburgh, Penn. Dr. EDWARD B. DENCH: Has it been in use for any length of time? Dr. MCKERNON: About one year and a half. I think the end of the piston can be made lighter by using some other form of metal. Dr. ABRAMS: Is it necessary to use vaseline? Dr. MCKERNON: No lubrication is necessary.

A case of acute diffuse external otitis.

Dr. JOSEPH A. KENEFICK: Through the courtesy of Dr. Dench I wish to present to the Section a case of acute diffuse external otitis. This man came to the hospital four weeks ago and said for two weeks previously he had suffered from pain in the ear, due in all probability to an acute purulent process in the middle ear. When he sought relief some proprietary preparation was prescribed for him which contained carbolic acid. Following its use came a diffuse inflammation of the structures of the external canal, closing it completely so that a probe could scarcely be entered. It was impossible to make out whether the tympanic membranes were affected or not. *Treatment* consisted of irrigation of the parts with a *1:3000 hot solution of bichloride of mercury* every three hours, and he has been very faithful in carrying out this treatment. After four weeks of this treatment the drum can be partially seen on one side, but the other canal is still closed. It seemed to be a long time before obtaining a view of the drumheads. I did not resort to any surgical procedure because of the steady but slow disappearance of the swelling. The drums were not affected so far as I know. It is impossible to see them. In these cases they seldom escape.

Dr. J. OSCROFT TANSLEY : What was the nature of the disease ?

Dr. KENEFICK : I cannot say, but I think it was the result of the irritation of the carbolic-acid mixture which he introduced into both canals.

Discussion.—Dr. M. D. LEDERMAN : A few years ago I reported a case of diffuse external otitis which was the result of the careless use of carbolic acid. The patient had some pain in the ear and a friend advised her to use a douche of carbolic acid, one dram in a little water; this was to be used in both ears. The acid was not thoroughly mixed with the water. As a result, she developed not only a diffuse otitis of the canal and concha but also an œdematous condition of the face, extending to the eye. She probably had a profuse serous discharge that continued for three days — peculiar predisposition for this form of irritation. The woman suffered considerably, for the canal was much swollen. She was treated according to the dry method, and about two weeks after the first application of the remedies the drum was seen and it was noted that the external portion was exfoliated. No middle-ear trouble arose from it. Subgallate of bismuth and one quart of zinc oxide was applied.

Dr. EDWARD B. DENCH : This is one of the few cases of external otitis which cannot be classed as symptomatic. Wiping out the canal shows that there is a superficial infection of the deeper portion of the canal, a comparatively rare condition. So far as my experience goes, diffuse external otitis, with tumefaction in the immediate vicinity of the drum membrane, is almost always indicative of involvement of the mastoid process. In this instance only the soft tissues are involved.

Dr. ROBERT C. MYLES : Was there any perichondritis ?

Dr. KENEFICK: Yes. There was not much exfoliation. Since the trouble responded to the irrigation treatment it was kept up.

Dr. McAuliffe: Was the patient treated by the douche? Dr. Kenefick: Corrosive sublimate solution, $\frac{1}{5000}$, was used.

Dr. McAuliffe: As this condition seems to me somewhat similar to a chronic dermatitis or chronic eczema I should like to know if such watery treatment would not be contra-indicated. Dr. Kenefick: There was pus in the canal at all times and under that treatment the patient did well.

A case of meningitis from extension of acute purulent otitis media through osteomyelitis of the petrous bone. Operation. Autopsy. Microscopic examination.

By Arnold Knapp, M.D. Published in full in this number of the Archives.

Discussion.—Dr. Edward B. Dench: I think that we all have listened with a great deal of interest to the paper of Dr. A. Knapp which has certainly attracted the attention of all of us. The symptoms of meningitis, whatever the channel of infection may be, are very apt to be confusing and we all know that any operative interference is, as a rule, of little value. At the same time, I believe, as the writer of the paper has stated, that we should always operate in these cases. I think that Dr. Macewen in twelve cases of beginning meningitis saved fifty per cent.

Dr. Knapp's case reminds me, in some points at least, of a patient who was referred to me by Dr. Booth, of this city. It was reported before the American Otological Society five or six years ago. In this particular instance the man was suffering from a chronic middle-ear suppuration and he suddenly began to have vertigo, severe unilateral headache, and irregular temperature. I was in doubt as to the nature of the trouble. Both drum membranes were entirely destroyed. One ear was practically dry, but upon the side on which the patient complained of the headache, the discharge was quite abundant. The caries in the tympanum had been going on for a long time. I first instituted the ordinary measures of asepsis through the external meatus, *i. e.*, syringing the canal. The patient became worse, running an irregular temperature, from 100° to 104°, the temperature gradually rising higher and higher. I decided to operate and I entered the middle cranial fossa in the typical manner, after first opening the mastoid antrum. On exposing the dura, at a point one inch above the external auditory meatus, the dura seemed to be normal, but, when it was incised, there gushed out a turbid fluid from the subdural space. This fluid seemed to come from a small pocket over the posterior surface of the pyramid. The brain substance was punctured without result. On exposing the lateral sinus this was found to be normal. An antiseptic packing was introduced between the dura and the brain substance so as to wall off the area of infection as completely as possible. The patient was returned to bed and made a perfect recovery without any recurrence of the symptoms. To Dr. Booth and myself it seemed like a case of beginning meningitis and which we had taken at an early stage and successfully walled off the inflammatory focus from the general cranial cavity in the same way that in appendicitis the appendix is walled off from the general peritoneal cavity.

I have been very much interested in the paper, which offers a large field for discussion.

Dr. M. D. LEDERMAN : Have listened with much interest to Dr. Knapp's paper because it helps me to account for a fatal termination in a case where there were cerebral complications and yet in which no path of infection could be traced from the mastoid or by continuity through the attic. I can recall two cases of a similar nature which were operated upon and which terminated fatally, with meningeal symptoms, without symptoms pointing to a circumscribed lesion.

The first case was a man who was brought into the hospital with a subacute otitis suppurativa about five o'clock in the evening and I was summoned to operate. The patient was unconscious. He had been treated aseptically in the usual manner by the practitioner under whose observation he was for about six weeks. The man complained of a little tenderness over the mastoid, and he seemed to be doing well, attending to his business as usual. Suddenly that morning he became dizzy and then unconscious. That was all the history obtainable. He was brought to the hospital and operated upon. Extensive mastoid disease was found, particularly at the base and at the antero-superior wall of the antrum. Soft bone and granulation tissue was removed from this region and the dura was found diseased, covered with granulation tissue, and thickened. The dura was incised, and although a slightly discolored fluid escaped no pus could be found. Numerous punctures were made with a small knife into the brain without finding a pus cavity. The man did not rally from the operation and eight hours afterwards he died. An autopsy was refused. This was a case where we probably would have found an extension of the inflammation through the labyrinth and internal auditory canal.

In another case where the patient suffered from symptoms of a chronic suppurative otitis, the discharge continued in spite of antiseptic treatment and curetting. He had had some dizziness but no particularly marked symptoms except a temperature of 100° F. He was operated upon, but did not improve, complaining of severe frontal pain. The patients with cerebral complications who have been under my care and in whom headache was a prominent symptom, have complained that the pain was most marked in the frontal region near the side of the affected ear. This patient was operated upon, but only disease in the attic was found, together with some granulation tissue in the antrum. Microscopical examination revealed the diplococcus meningitidis from a specimen of the secretion from the dural cavity above the tegmen, but the pathologist remarked that this diplococcus was frequently found in suppurative ears, and had no special significance, though it was present in meningitis. This patient was operated upon a second time, bone being removed along the anterior portion of the wound, but no further disease was found except some turbid fluid, which indicated a meningeal involvement. The patient died and autopsy was refused.

A third case, which fortunately recovered after operative intervention, was under observation for some time without presenting a characteristic clinical picture. The patient had had a suppurative condition, but the drum had healed over, and there were no further evidences of active middle-ear trouble. He complained of a localized pain at the base of the mastoid and at its posterior border. This patient had some elevation of temperature at times without any further symptoms of mastoid involvement except a chilly sensation off and on. He worked in ditches, and so malaria was suspected and the blood examination revealed the plasmodium. Five grains of quinine were injected and the temperature then came down, and for a week the man's improved condition permitted me to feel that he was getting well, though the localized tenderness still persisted. In this case the man owed his life to the use of the ophthalmoscope, as his eyes were examined daily for any evidence of cerebral irritation or pressure. Tortuosity of the retinal vessels was discovered at one of the examinations, so an exploratory operation was decided upon. The antrum contained no pus but some granulation tissue which was removed.

About two drops of pus were found in the cells. Pus was found in the sinus, and thinking this accounted for the symptoms I was about to finish the operation when my probe came upon a soft spot at the superior and posterior part of the antrum ; when this was scraped away an epidural abscess was found and drained. The man got well without any further complications. In cases where histories point to cerebral extension without evidence of infection by continuity of tissue at the operative site, we must bear in mind the possibility of such infection by way of the internal ear.

Dr. McKERNON : A case that I saw last April gave about the same history as one of Dr. Lederman's cases, and also somewhat similar to the one referred to by Dr. Dench. The history given me was that the case had been seen by a colleague two days previous. There was a profuse purulent discharge from the external auditory meatus, with a sagging of the posterior-superior canal wall, and marked tenderness over the entire mastoid process, and intense headache on the affected side, with complete absence of hearing also on that side. The temperature was 104.6°, pulse 130, and respiration slightly above normal.

Within a few hours after seeing the case he opened the mastoid but found no pus. The external cortex was very thick. The entire mastoid process was removed and free communication established between the antrum and middle ear.

At the request of the operator I saw the patient in consultation twenty-four hours after the operation. The temperature at that time was 105.2°, pulse 144, and respirations 36. Cerebration seemed normal, and the patient complained of intense pain all over the affected side. There was a slight purulent discharge in the auditory canal of the affected side. The eyes were examined with negative result. The pain was so intense that he was continually rolling from side to side in the bed.

He was taken to the operating room, and an exploratory operation was performed in order to examine the middle cranial fossa. The dura was found normal ; the dura over the cerebellum was then exposed posterior to the sinus, and here also the parts seemed to be normal.

Upon removing a small portion of the bone, lower down over the cerebellum, there was seen to exude from between the dura and inner cortex about a drachm of straw-colored fluid. A probe was passed still farther down between the dura and the bone covering it, and a small amount of fluid similar in character to that found above oozed out.

The operator did not wish to proceed any farther; the patient was taken to his bed and died some eight hours later without regaining consciousness.

An autopsy was performed a few hours after death and there was found a diffuse leptomingitis of the base with no extension higher than the upper two thirds of the cerebellum.

I give the history of this case because it was somewhat similar to those already given this evening, but differing in the fact that it did not show any distinct pathological condition in the meninges near the exit of the discharge

REPORT ON THE PROGRESS OF OTOLOGY DURING THE SECOND QUARTER OF THE YEAR 1901.

BY DR. A. HARTMANN

Translated by Dr. ARNOLD KNAPP.

ANATOMY AND PHYSIOLOGY.

105. **G. Alexander.** On the development of the ductus endolymphaticus (recessus labyrinthi). *Arch. f. Ohrenhlk.*, vol. lii., p. 18.

106. **Schurygin.** The pupillary reaction on excitation of hearing with tuning-forks. *Russki Medicinski Westnik*, July, 1891.

107. **Nuvoli.** On the theory of hearing. *Arch. italiano di otologia*, vol. xi., No. 3.

108. **Panse.** The organ of equilibrium and hearing of the Japanese dancing mouse. *Münch. med. Wochenschr.*, No. 13, 1901.

109. **Barrago-Ciarella.** On suture of the spinal accessory with the facial in facial paralysis. *Polichlinico*, vol. viii.

110. **Friedmann.** On artificial excitation of the aural labyrinth. *Inaug. Dissert.*, Strassburg, 1901.

105. ALEXANDER has examined the development of the ductus endolymphaticus in serial sections and models of guinea pigs, and believes that this duct, just as Kibel has shown in the chick embryo, is developed from the original area of communication between the horn plate and the labyrinth. The ductus endolymphaticus in the guinea pig and chick is not the homologue of a similarly situated canal described by other authors in the case of a number of vertebrates which develops as an independent prolongation of the labyrinthine vesicle, but is independent of the original region of communication. DENKER.

106. During an examination of the hearing in soldiers the author noted a variation in the size of the pupil on the approach of the vibrating tuning-fork to the ear. In the healthy there is at

first a transient, variable contraction of the pupil, which is followed by a dilatation. This pupillary reaction is well marked in the case of large tuning-forks with 256 to 512 vibrations per second. The high tones with 1024 vibrations produce a very weak reaction. The reaction is present also on testing the bone conduction; usually the homonymous pupil and then the other pupil react. On withdrawing the tuning-fork the pupil on the same side returns to normal before that of the other side. If the ear be deaf the pupillary reaction on the homonymous eye is much weaker and may be absent, while the pupil on the side corresponding to the healthy ear reacts very promptly. This physiological pupillary reaction can be of diagnostic service to discover simulation. The testing of bone conduction is especially important. The loss of the reaction may point to deep-seated disturbance in the central nervous system. The reaction is much more pronounced in neurasthenics, corresponding generally to the condition of the patellar reflex. The reaction occurs most frequently in women and in children, and the examination must in all cases be repeated a number of times. SACHER.

107. NUVOLI has carefully gone over Zimmermann's theory of hearing, and refers to his experiments described at the meeting of the Italian Otological Society in Naples, in April, 1900, which show in a simple and convincing manner that the transmission of sound takes place through the drumhead and ossicles. The author questions the correctness of Helmholtz's theory which Zimmermann has adopted, and on the following grounds:

If the vibrations of the radial fibres of the basilar membrane occur through resonance the true formation of sound must take place in the labyrinth, because resonance always produces a sound. If this, however, were the case, it should be evident to the phonendoscope, by which the slightest sound in any part of the body can be heard, or it should be confirmed by the electric current. The original paper of Nuvoli is strongly recommended to those interested in this branch, and especially the report of his experiments pertaining to the physiology of the middle ear, which are published in the tenth volume, nos. 1 and 2, of the *Archivio italiani di otologia.* RIMINI.

108. A marked difference between the organ of equilibrium and hearing of the domestic mouse and the dancing mouse does not exist. Rotatory movements are probably of central origin. SCHEIBE.

109. In two experiments on dogs the author united the peripheric end of the divided facial with the central end of the divided spinal accessory. Facial paralysis disappeared in both cases after several months, and there only remained, especially in the second dog, a slight atrophy of the muscles innervated by the facial. In a third experiment the peripheric end of the facial was united to the central end of the divided vagus; the result in this case was also favorable, and the facial paralysis disappeared in eight months. RIMINI.

110. The author has studied the action of chloroform instillations on the aural labyrinth; other substances were also used, but ammonia was the only one to produce irritation of the aural labyrinth at the beginning. Rabbits, doves, and guinea pigs were experimented upon. In general, Brown-Sequard's results of the action of chloroform on the labyrinth were confirmed, namely: that the animals act just as if the labyrinth had been destroyed. Chloral hydrate does not act like chloroform on the ear, but is inert. DREYFUSS.

GENERAL.

a.—REPORTS AND GENERAL COMMUNICATIONS.

111. **Reinhard.** A rare case of right-sided facial paralysis, stenosis of the external auditory canal, and occlusion of the labyrinth following gun-shot injury. *Arch. f. Ohrenhlk.*, vol. lii., p. 59.

112. **Randall, B. Alexander.** Localization of sound, and its bearing on hearing. *Phila. Med. Journ.*, May 4, 1901.

111. The bullet penetrated the soft parts below the right zygomatic process without injuring the parotid, and had torn through the anterior, lower, and posterior walls of the membranous ear canal at the junction of its external with its middle third, had struck the facial nerve below the stylo-mastoid foramen, and had come out behind the apex of the mastoid process. The permanent results of the injury were deafness, through labyrinthian concussion, paralysis of the muscles of the right half of the face (taste, secretion of saliva, and soft palate normal), stenosis of the auditory canal, and difficulty of mastication. DENKER.

112. RANDALL, in speaking of the attempt made to map the field of hearing in a manner analogous to that of vision, draws attention to the essential difference, that sound-waves are not, like light-waves, propagated only in straight lines. The *absolute* field

of hearing is hardly definable. There should be little if any difficulty in localizing sounds when both ears are in good condition. Not only are they lateralized, but the other factors as to their direction can generally be subconsciously determined. One ear is often given to the sounds engrossing us, while the other merely keeps guard-hearing, in a measure side-tracking those on the busy side which might confuse its task. The condition is very different when one ear must act alone, unaided by its fellow. The physical problem is little changed, and the auditory apparatus receives and transmits to the percipient centres the same range of sounds coming from practically all directions; but the psychic task is far more complex. One side of the brain, to a much greater extent than usual, has to receive and analyze all the impressions, and these lack that element of double yet diverse character which in vision we call stereoscopic. Rotation and other movements of the head can, as in binocular vision, furnish some localizing factors; yet the problem remains too largely a mental one, and the "fatigue of the deaf" is by no means absent in those who, with one perfectly good ear, are often unrecognized by their companions as having any lack. It is time, he thinks, that the value and importance of "binaural hearing" should be better appreciated. CLEMENS.

b.—GENERAL PATHOLOGY.

113. **Jackson, Chevalier.** An overlooked nasal factor in ear disease. *Jour. Amer. Med. Assoc.*, May 25, 1901.

113. JACKSON believes that the nasal condition which is productive of ear disease consists of hypertrophic thickenings, usually on both sides of the vomer, near the posterior free margin, which deflect the inrushing blast of dust-laden, dry, cold air against the Eustachian eminences, resulting in perpetual irritation of the mucous membrane in the vicinity of the tube mouths. This action is entirely independent of any harm such hypertrophies may do in increasing stenosis. The growths are soft, though only slightly erectile. They have been present in 25 % of the writer's private ear cases, and in 11 % of dispensary nose and throat cases. It is not claimed that these thickenings are present in all cases of ear disease, nor is it claimed that ear or tubal troubles are present in every case with these thickenings. Their removal, together with that of posterior turbinal enlargements is advised. Either Bryan's ethmoid curette, Seiss's curette, or a long-shanked, probe-pointed tenotome will do the work satisfactorily.

CLEMENS.

c.—METHODS OF EXAMINATION AND TREATMENT.

114. **Jürgens.** On the diagnostic value of the rhodan reaction on the saliva in ear disease. *Wojenno-Medicinski Shurnal*, Feb., 1901.

115. **Thies.** On percussion of the mastoid process. *Inaug. Dissert.*, Leipzig, 1901.

116. **Hotz, F. C.** On the use of camphoroxol and menthoxol in diseases of ear. *Annals of Otol., Rhinol., and Laryngol.*, February, 1901.

117. **Kenefick, J. A.** The akouphone and its limitations. *N. Y. Med. News*, April 13, 1901.

118. **Ellett, E. C.** Anæsthesia of the ear-drum. *Jour. Amer. Med. Assoc.*, April 27, 1901.

114. Disease of the ear seems to influence the functions of the neighboring organs, as, for instance, that of the salivary glands. The condition of the innervation of the latter exerts a great influence on the quantitative and qualitative condition of the saliva. The human parotid normally secretes potassium rhodan and sodium rhodan, which may be absent from the saliva in disturbances of the innervation of the gland. JÜRGENS found the rhodan reaction to be absent in chronic purulent otorrhœa. In one-sided otorrhœa the rhodan reaction may be positive, because the parotid on the healthy side furnishes potassium rhodan to the saliva. The author has, therefore, endeavored to collect the saliva from each parotid separately. In inflammations of the parotid, occlusions of Stenson's duct, the rhodan reaction is of course wanting in the saliva. Many cases are added to show the diagnostic importance of the rhodan reaction. Unfortunately this reaction is influenced by certain medicaments.

SACHER.

115. After experiments on the macerated skull of the cadaver and on the living, THIES comes to the following conclusions: The percussion note produced over the mastoid process depends upon the vibrations of the entire skull. Central osteitis, just as osteitis of the mastoid process, without inflammation of the cortex at the area of percussion, may fail to produce dulness in the absence of secondary changes in the soft parts. Dulness is to be regarded simply as dulness of the soft tissues, and may occur normally as well as pathologically. BRÜHL.

116. These new remedies are combinations of peroxide of hydrogen and alcohol with camphor or menthol; they are of great deodorizing power, non-irritating, and very stable. HOTZ was induced to try these "oxols" through an opinion expressed by Stetter of Koenigsberg, who had used them successfully in

stubborn cases of chronic otorrhœa where other remedies had failed. Although the number of his trials is too small to draw any definite conclusions as to their value, he nevertheless feels that the results justify making more extended tests with them. Being non-irritating, they may be used in the early stages of infectious otitis and perhaps often arrest further extension of the inflammation. Their main field of usefulness, however, is in the tympanic cavity, although they may prove as valuable in the after treatment of mastoid operations and in certain affections of the external meatus. In one case of aspergillus niger a complete disappearance of the mould occured in three days, and it has not returned up to the present time. CLEMENS.

117. In considering the various forms of deafness which are benefited by mechanical contrivances, KENEFICK limits the usefulness of the akouphone to that class where there has been disease involving but not wholly destroying the labyrinthine nerve terminals—deaf-mutes. In his opinion this instrument has attained a greater degree of success in teaching deaf-mutes not only inflection of the voice but articulate speech than ever before achieved. The instrument is still in a crude state. CLEMENS.

118. In order to accomplish complete anæsthesia of the eardrum which will permit of a painless paracentesis, ELLETT advocates the use of equal parts of cocain, carbolic acid, and menthol. He has been most successful in allaying pain. In one case a double paracentesis was performed without the slightest suffering. The mixture is used in the following way : After cleansing and drying the canal, the mixture is applied on a cotton-tipped applicator directly to that part of the drum which is to be incised. The surface of the drum becomes white, thereby enabling the operator to confine his incision to the parts anæsthetized.

CLEMENS.

d.—DEAF-MUTISM.

119. **Eschweiler.** The pathology and hearing power of the deaf-mute ear. *Gesellsch. f. Natur. u. Heilkunde zu Bonn*, June 17, 1901.

120. **Kumberg.** A case of hysterical deafness. *Wratsch*, No. 19, 1901.

121. **Carroll, J. J.** Pathology of deaf-mutism. *Journal of Eye, Ear, and Throat Diseases*, March and April, 1901.

119. The author reviews the pathological changes which have been found up to the present time in the ears of deaf-mutes, and Bezold's tests for hearing. The correlation of the results of the

functional examination and the pathological findings is still deficient. In partial hearing it should be possible to demonstrate a partial disease of the sound-receiving organ. HARTMANN.

120. The condition developed very characteristically in a soldier suddenly after a psychical and bodily injury. In addition to the deaf-mutism several motor and sensory disturbances were present, which appeared suddenly and disappeared without trace. The deafness lasted four weeks, the loss of speech, about eight weeks. There was complete recovery. SACHER.

121. From a careful analysis of the one hundred and fifty autopsies on deaf-mutes collected and reported by Saint-Hilaire CARROLL shows that the pathology of deaf-mutism varies greatly; that all the anatomical alterations of the ear which are capable of producing grave deafness have been found in deaf-mutes ; that no one organic lesion has been constantly present ; and that, according to the present state of our knowledge, there is no single definite pathological condition which is characteristic of the disease. A plea is made for more thorough study of the pathological specimens obtained from such autopsies. CLEMENS.

EXTERNAL EAR.

122. **Dombrowski.** A case of cartilaginous tumor in both ear lobules after perforation. *Jeshenedelnik*, No. 15, 1901.

123. **Grosskopff.** The inflammations of the external ear. *Klin. Vorträge* (Haug's), vol. iv., 6, 1901.

124. **Radzich.** A case of complete occlusion of the bony auditory canal by a bony diaphragm. *Medicinskoji Ohosvenje*, April, 1901.

125. **Tommasi.** A case of primary diphtheria of the external auditory canal. *Annali di laringologia e d'otologia*, ii., No. 2.

126. **Nezzi.** A case of sarcoma of the external auditory canal. *Bolletino delle malattie dell'orecchio naso e gola*, xix., No. 9.

127. **Grossmann.** A pulsating cicatrix of the drumhead. *Berliner klin. Wochenschr.*, No. 24, 1901.

128. **Lau.** The healing of old perforations of the drumhead. *St. Petersburger med. Wochenschr.*, No. 29, 1901.

122. After perforation of the lobules in a girl of six, cartilaginous growths appeared on the posterior surfaces. In six weeks the one on the left ear had attained the size of a small nut, that on the right the size of a pea. The tumors were hard and round and easily removed. SACHER.

123. This is a description of circumscribed and diffused otitis externa. The author treats the beginning of otitis externa with

this ointment: liquor alumini acetici, 2; lanolin, olive aa. 9: In advanced cases a free incision under narcosis is recommended.

BRÜHL.

124. The author feels compelled to regard the formation of the bony diaphragm as the result of a chronic otorrhœa from which the patient was suffering. SACHER.

125. This case is regarded by the author as an undoubted one of primary diphtheria of the external auditory canal, as, in addition to the typical otoscopic picture and microscopic examination, the source of infection was known. A girl, eleven years of age, was taken ill with severe earache, high fever, and malaise, four days after she had introduced into the ear a pen-holder belonging to another girl whose sister was suffering from diphtheria. The lymph nodes in the neck and aural region became swollen and typical diphtheritic membrane appeared in the ear canal. Anti-diphtheritic serum was injected twice and the child recovered on the seventh day. The ear canal was perfectly free from membrane and dry. RIMINI.

126. After a brief review of the literature the author describes a case of a boy of ten who suffered from chronic purulent otitis after measles. A tumor was removed from the external auditory canal which had occluded the lumen. Two months later the discharge had ceased but the tumor had recurred at its original site. Radical operation was refused and the tumor was again removed, only to recur after a few months. The report of the histological examination showed the tumor to be a sarcoma orginating primarily in the auditory canal. The malignancy of the growth was confirmed by the histological examination and the tendency to recur after the otorrhœa had ceased. RIMINI.

127. The cicatrix in the drum showed an arhythmical pulsating reflex. There was some congestion in the eye grounds. The cause was a compression of the carotid by a right-sided thyroid tumor with secondary cardiac hypertrophy. BRÜHL.

128. A case cured by treatment with trichloracetic acid used according to Okuneff. About two thirds of the drum were missing, the part below and back of the manubrium of the malleus. The diluted acid was applied once a week, the treatment lasting a year and a half. The new-formed scar tissue was gray, shiny, and not different from the normal drum. SACHER.

MIDDLE EAR.

a.—ACUTE OTITIS MEDIA.

129. **Bezold.** Further observations on excrescences of the drumhead in acute purulent otitis media; their treatment and pathology. *Arch. f. Ohrenhlk.*, vol. li., p. 299.

130. **Cagnola.** Purpura rheumatica, a complication of an infection of otitic origin. *Ann. di laring. ed otol.*, ii., No. 2.

131. **Barrago-Ciarella.** A case of acute otitis caused by the blastomycetes. *Ann. di otologia, rinologia*, vol. ii., No. 1.

132. **Bar.** Facial paralysis in a case of acute catarrh of the middle ear. *Bulletins de la soc. franc. d'otologie, etc.* Congrès de 1900.

133. **Bochner.** Treatment of acute purulent otitis. *Inaug. Dissert.* Leipzig, 1901.

134. **Nemtschenkow.** Treatment of otitis media and its complications. *Bolwitschnaja Gaseta Botkina*, 10 and 11, 1901.

129. Bezold refers to Grünwald and his publications which have preceded Katz's paper on perforating excrescences of the drumhead. According to Bezold, these excrescences occur when suppuration is of a protracted course, associated with violent inflammatory conditions, as is especially the case in influenza, and when there is a narrow perforation opening into the posterior upper quadrant. The protruding mass, which at first is composed of the hypertrophied mucous layer of the drum, becomes associated later with involvement of the thick connective-tissue layer of the cutis. The macroscopic characteristic feature of the growth is the centrally situated perforation. The lining epithelium of the canal is not a continuation of the mucous epithelium but is formed by the external epidermis. Pathologically the excrescence is similar to a granulating hypertrophy occurring in the presence of a fistula. Bezold regards it as unnecessary to distinguish between the bare perforating hypertrophies and those covered with epidermis. As regards treatment, the protruding mass should be removed from the posterior and upper quadrant with a snare, and a large counter-opening should be made to ensure better drainage. Amongst 1131 cases of acute purulent otitis Bezold observed and operated upon 69 perforating excrescences. The occurrence is consequently a more frequent one than Katz has stated, who found this condition to be present in only 6 cases out of 200. Denker.

130. The patient, thirty-five years of age, suffered from acute purulent otitis media and a month later with typical mastoiditis.

Small hemorrhagic areas, varying in size from the size of a pin-head to that of a lentil, appeared on both lower extremities and the arms. The malleolar region was slightly swollen on both sides. The mastoid process was opened and the diseased bone and granulations removed. The wound healed after a protracted course. Ten days after their appearance the hemorrhagic spots disappeared, leaving traces of a yellowish-green color. This case is interesting not only from the rarity of purpura as a complication of otitis but also in the investigation of the probable connection. CAGNOLA believes the purpura in this case to be connected with the pyæmic condition in which the patient was, basing this view on the fact that articular rheumatism and purpura rheumatica are occasionally preceded by acute angina.

RIMINI.

131. According to the author this is the first case of acute middle-ear disease to be described where a serous exudate, obtained under the strictest antiseptic precautions by paracentesis of the drum membrane, gave rise to a growth of blastomycetes, in pure cultures on bouillon and gelatine media. The fungus was very similar to the blastomycetes lithogenes. RIMINI.

132. Facial paralyses in cases of acute purulent middle-ear disease are not rare and usually recover rapidly after paracentesis. The author has observed two cases of recovery; in a third case, a patient with arthritic symptoms, the facial paralysis persisted notwithstanding the spontaneous perforation of the drum and profuse otorrhœa. The mastoid was opened and the horizontal portion of the Fallopian canal was exposed. The walls were found to be roughened in broad carious bands and covered with fungoid granulations. This area was carefully curetted and the facial paralysis disappeared in 14 days. The author draws attention to the fact that in otitic facial paralysis, just as in other peripheric facial paralysis, a more or less well-pronounced lagophthalmus is present, while the soft palate on the same side is not paralyzed. This is not in accordance with the view of Lermoyez, who thinks it is probable that the soft palate is innervated not by the facial but by the vago-spinalis. In this case of BAR the tongue deviated to the side opposite the facial paralysis, which is only produced by central lesions affecting the hypoglossal nerve. This deviation of the tongue the author is unable to explain, as anastomosis between the facial and the hypoglossal nerves is not known to exist. The possible anastomosis of the facial with the

lingual and the naso-pharyngeal may here come in question. Paracusis was also present in this patient, explicable by the interference with the function of the stapedius muscle, also disturbances of the sense of taste and of the salivary secretion. The author recommends in case of facial paralysis where the inflammatory infection of the walls of the Fallopian canal can be assumed to be present, a carefully performed surgical exposure.

SCHWENDT.

133. This paper is a plea for the dry treatment of acute purulent otitis. BRÜHL.

134. The author does not believe in the dry treatment nor in the irrigation of the ear with large quantities of fluid. To cleanse the ear he employs a mixture of equal parts of alcohol and distilled water to which 2 per cent. of carbolic acid is added. Ten to 15 drops of this fluid are carefully introduced into the ear on a pledget of cotton which is allowed to remain in place for two or three minutes. The author has succeeded in curing otorrhœa of many years' standing by this method. If this treatment is insufficient and the suppuration depends upon some deep-seated changes in the ear, a 5 per cent. watery solution of carbolic acid is injected into the bony part of the auditory canal. The auricle is held forward and the needle of the aspirating syringe is introduced into the upper margin, passed along the posterior and superior wall of the cartilaginous canal as deep into the bony canal and the middle ear as possible. In adults an entire syringeful is injected. The dangers of intoxication need not be considered. After the injection of a 5 per cent. carbolic acid solution a marked diminution of all inflammatory symptoms takes place. The pain and discharge are diminished and disappear after twelve days. Should this not be the case a second injection is needed. More than three injections need not be made. The author has treated 36 cases, 9 acute and 27 chronic, after this method with the best results. SACHER.

b.—CHRONIC PURULENT OTITIS.

135. **Hecht.** Hot-air treatment in chronic purulent otitis. *Münch. med. Wochenschr.*, 1901, No. 24.

136. **Görke.** Pathological examination of aural polypi. *Arch. f. Ohrenhlk.*, vol. lii., p. 63.

137. **Biehl.** A small contribution to the surgery of the middle-ear *Arch. f. Ohrenhlk.*, vol. lii., p. 23.

138. **Grossmann.** The influence of the radical operation on hearing. *Arch. f. Ohrenhlk.*, vol. lii., p. 28.

139. **Stucky, J. A.** Ossiculectomy for chronic suppurative otitis media. *New York Medical Journal*, May 25, 1901.

135. A metal canula is attached to a hot-air apparatus such as is used in the treatment of lupus, and the air is transmitted directly into the tympanic cavity. The author believes he has had benefit from the employment of this method in a number of cases. SCHEIBE.

136. GÖRKE divides aural polypi—which means growths of inflammatory origin only—into the two fundamental varieties, granulation tumors and mucous polypi. The structure of an aural polyp consequently should reveal the histological peculiarity of granulation tissue or that of inflammatory hyperplastic middle-ear mucous membrane. In the progressive process of the tissue growth of new formations the connective-tissue alterations of the epithelium are first described. Solitary follicles have been observed in aural polypi, but glands have only been seen in mucous polypi. As the evidence of retrogressive metamorphosis, necrosis, pigment metamorphosis, fatty, hydropic, mucoid, and hyaline degenerations, calcification, ossification, cystic degeneration, and central cholesteatomatous formation were observed. The latter is supposed to be peculiar to aural polypi. Hair was found present in three cases, foreign bodies, gauze fibres in one, and dermatol powder in another.[1] DENKER.

137. BIEHL reports on an operative case of cholesteatoma of the aditus with perforation of Shrapnell's membrane and well-preserved hearing. Instead of seeking for the antrum during the operation the author made the lateral wall of the attic his objective point by removing in thin layers the posterior wall of the auditory canal down to a ridge sufficient to serve as a support for the drum. Four weeks later the ear was completely dry and the hearing had improved for the whispered voice from four to eleven metres. The author regards as advantages for this method the fact that the sinus is not injured and the dura not exposed, and the drum membrane and ossicles are retained.

The reviewer would like to point out that also in the radical operation of Zaufal and Stacke the drum membrane and ossicles can be very well retained and that the danger of injury to the sinus cannot be excluded in all cases. He would prefer to expose the antrum and the aditus according to Zaufal and Stacke, with preservation of the drum and ossicles. DENKER.

---

[1] The investigations of Bezold, Scheibe, Grünwald, and Katz on the histology of aural polypi are not recorded in the literature.—*Reviewer.*

138. The ear was tested before the operation and after healing had taken place, with the whispered voice and with high (c^4 and f^4) and low (C and A) tuning-forks. In the four cases where the ossicles were retained the hearing power was very much improved in two, in one it remained the same, and in the fourth it became worse (luxation of the hammer-anvil joint). In the 32 ears of the 16 patients operated on both sides, in 31.3 % the hearing was improved after the operation ; in 28.1 % it was poorer, and in 40.6 % it remained the same. In 180 one-sided operations, the hearing was improved in 46.1 % ; it was poorer in 23.3 %, and remained stationary in 30.6 %. In general, therefore, the percentage of deterioration of hearing in Lucæ's clinic is higher than according to the statements of Stacke, Grunert, and Schwartze. The results agree with the figures of Trautman-Stenger, where the hearing was improved in 36.2 % ; deteriorated in 29 %, and stationary in 34.8 %. In nine cases the hearing power for whisper increased from 7.5 to 11.5 metres. The greatest improvement was found in those cases where the ossicles were not preserved.

Trautman's statement that improvement of hearing after radical operation depended upon the thinness of the epidermis covering the operative cavity could not be confirmed. The greatest deterioration was in one case, 10.25 metres. The greatest differences in the hearing before and after operation occurred in young individuals. The author comes to the following conclusions which in particular are at variance with the observations made at the Halle Clinic :

(1) In case of intact labyrinth improvement in hearing is to be expected by operation in 48.5 %, especially when the deafness was considerable before the operation. (2) The hearing remains stationary or may become worse in not an infrequent number of cases, namely, in 20.2 % to 31.3 %. (3) In those cases where the functional examination before the operation has shown disease of the inner ear, the hearing has most frequently remained unaffected by operation, namely, in 45.6 %. (4) In a considerable number, 38.8 %, of cases belonging to this category, a decided improvement of the hearing often takes place. (5) The possibility of diminution of hearing power is most improbable (15.3 %). DENKER.

139. As the entire anatomical arrangement of the middle-ear favors the development of pathological conditions, the main object in cases of chronic suppuration is to secure uninterrupted drainage. The ossicles were removed in twenty-nine cases, the stapes in two cases with results justifying the operation, and in none had the disease existed less than seven years. The line of treatment is: After the removal of the ossicles and the necrotic tissue, the anterior attic wall is removed, which gives very free drainage. This method is considered conservative and satisfactory and should be preferred to the radical operation, at least as a first resort. CLEMENS.

c.—CEREBRAL COMPLICATIONS.

140. **Preysing.** Nine brain abscesses in ear and nose disease. *Arch. f. Ohrenhlk.*, vol. li., p. 262.

141. **Bertelmann.** A healed case of otitic meningitis. *Deutsche med. Wochenschr.*, No. 18, 1901.

142. **Hegener.** On acute serous meningitis. *Münch. med. Wochenschr.*, No. 16, 1901.

143. **Hölscher.** An unusual case of extensive sinus disease after middle-ear suppuration. *Arch. f. Ohrenhlk.*, vol. li., p. 110.

144. **Hölscher.** Is the possible insufficiency of a healthy internal jugular vein a contraindication to ligature of the diseased vein in otitic thrombosis of the sigmoid sinus? *Ibid.*

145. **Hölscher.** A modified method of operating for otitic thrombosis of the sigmoid sinus. *Ibid.*

146. **Piffl.** Operations on the mastoid in complications of acute otitis, with report of seventy-five operative cases. *Arch. f. Ohrenhlk.*, vol. li., p. 241.

147. **Vierick.** Ligature of the jugular vein in the operative treatment of the transverse sinus. *Inaug. Dissert.*, Leipzig, 1901.

148. **Holmes, Bayard.** A case of antrum infection and sigmoid sinus thrombosis without present middle-ear disease, presenting the symptoms of facial neuralgia and none of the ordinary symptoms of disease in the pars petrosa; retropharyngeal gravity abscess, general sinus thrombosis without much impairment of cerebration; death after three months; partial autopsy; presentation of specimens. *Amer. Med.*, June 1, 1901.

149. **Duel, Arthur B.** Acute otitis media and acute mastoiditis in scarlet fever, measles, and diphtheria. *Med. Rev. of Rev.*, Mar. 25, 1901.

150. **Roosa, D. B. St. John.** A case of cerebellar abscess, the result of chronic suppuration of the middle-ear. *Post-Grad. Med. Journ.*, Apr., 1901.

151. **Dufour, Clarence R.** Infective sigmoid sinus thrombosis. *N. Y. Med. Journ.*, Mar. 23, 1901.

152. **Keiper, George F.** Some points in operating for mastoiditis. *Med. and Surg. Monitor*, Indianapolis, Ind., May 15, 1901.

153. **Randall, B. Alexander.** Notes on fifty operations for otitic extradural abscess. *Univ. of Penn. Med. Bull.*, Apr., 1901.

140. **Preysing** reports on two healed and two unhealed abscesses of the temporal lobe; on two healed and two fatal cases of cerebellar abscess, and on one abscess of the frontal lobe in nose disease. The author insists upon performing the operation for otitic brain abscess of the temporal lobe from the roof of the tympanum and antrum, and believes that in most cases after removal of this roof, the dura will be found affected at one place which indicates the way to the abscess.

In the first case there was a large abscess in the temporal lobe and thrombosis of the transverse sinus without symptoms. The abscess was as large as a hen's egg and was opened through the tegmen, and the transverse sinus was incised for a distance of about 3 *cm* from the knee down.

In the second case, a large temporal-lobe abscess was discovered over the tegmen. This abscess was situated quite far back, and after its evacuation the patient suddenly developed amnesic symptoms characterized by a complete obliteration of all topographical names (countries, cities, streets). This symptom soon disappeared and is explained by the author as the result of nutritive changes following the sudden evacuation of the abscess. The first case was encapsulated and without symptoms. The second appeared to be quite recent, without a capsule, and was accompanied by a pronounced slowness of the pulse and by septic fever.

The author regards the various kinds of brain abscess as simply stages in the same process of varying intensity.

As regards aspiratory puncture, it is necessary to go directly upward through the tegmen, and not inward.

The third case of temporal lobe abscess with fever after chronic otorrhœa succumbed to a meningitis of the ventricles. The fourth case likewise terminated fatally, running an afebrile course, after a chronic otorrhœa, and was not diagnosticated because the meningeal symptoms preponderated. At autopsy a left-sided temporal-lobe abscess with perforation into the ventricle was discovered.

In the cerebellar abscesses, the first ran an afebrile course with sinus thrombosis and abscess of the soft parts. After completion of the radical operation, a second operation was performed where granulations were removed from part of the left cerebellar hemisphere with scissors. The case recovered. During the entire course there was no fever, no reduction of pulse, no vertigo, only headache. The author thinks that the sinus thrombosis occurred first, with the abscess as a secondary lesion. In the second case, the cerebellar abscess, with fever, slow pulse, vertigo, stupor, nystagmus, and increased patellar reflex, was cured by trephining the posterior cranial fossa and evacuating the abscess.

In the second unhealed case of cerebellar abscess, the disease was not diagnosticated. Preysing related the course of a fatal case of left-sided frontal-lobe abscess after empyema of the left antrum of Highmore, frontal and ethmoid sinuses. Considerations of the origin of brain abscess after infection of the nose and ear follow. The peculiar relation which the lymph channels and the blood-vessels have to one another in the brain is commented upon. As the blood-vessels are situated in the lymph channels as in a sheath, the rapid extension of disease and the rapid disintegration of large parts of the white substance are apparent. The abscess makes a halt at the cortex because the cortex is supplied by blood- and lymph-vessels of the pia, and the larger blood- and lymph-vessels of the pia are situated exclusively in the white substance. DENKER.

141. This is a case of extradural abscess which recovered after evacuation of the pus and resection of the diseased bone, middle-ear spaces, with a transient facial paralysis. The diagnosis of meningitis was made because, before the operation, there were rigidity of the neck, high fever with free sensorium and normal eye-grounds, and because the fluid obtained from a lumbar puncture, performed during narcosis, was clouded, containing leucocytes and diplococci situated extracellularly. NOLTENIUS.

142. Case I. Chronic middle-ear suppuration with large perforation in the back. Voice at 75 *cm.* Pain in the head and ear, vertigo, vomiting, retarded pulse, subnormal temperature, optic neuritis, tenderness on percussion over the squama. At the radical operation granulations were found in the middle-ear cavities, caries of the facial canal, discoloration of the tegmen tympani and of the overlying dura. Incision in the cerebrum and cerebellum evacuated a clear cerebro-spinal fluid which was discharged in enormous quantities during the ensuing eight days. Recovery.

Case II. Chronic middle-ear suppuration. Swelling of mastoid process and in the canal; deafness, headache, vertigo, vomiting. At operation cholesteatoma and destruction of the lateral wall of the horizontal semicircular canal were found. Exposed sinus was normal. Five days after the operation, fever set in, slow pulse, apathy, hyperæsthesia, twitchings of the face and arm on same side. On incision of the cerebrum and cerebellum, clear cerebrospinal fluid escaped and continued to discharge in large quantities. Optic neuritis appeared later and then disappeared. Recovery took place with return of some hearing. HEGENER leaves it undecided whether this was a case of serous meningitis or not.

SCHEIBE.

143. This was a case of right-sided cholesteatoma of the middle-ear from which a thrombosis of both transverse sinuses and the longitudinal sinus, the large vein of Galen, the petrosal sinus, and the left cavernous sinus developed. At autopsy, in addition, an abscess as large as a hen's egg, was found on the left occipital lobe, purulent meningitis at the base and pneumonic patches. The patient was operated on five times under narcosis. First the radical operation followed by exposure and evacuation of a purulent thrombosed transverse sinus two days later. This, according to the author, would better have been done at the first operation, as the patient had had two chills with high fever. The jugular vein was previously ligated. After the second operation the condition improved. Twelve days later the temperature began to go up, and three weeks after the second a third operation was undertaken but had to be interrupted on account of profuse hemorrhage from the soft parts of the skull. Two days later the bone was removed in a backward direction, the sinus incised, and pus evacuated. General condition again improved; no headache. Fever persisted and headache returned in three days. Another operation took place. A large piece of bone was removed down and out. On introducing a probe beneath the dura, pus appeared. The dura was incised. On the following day there was pain in the occiput and neck and tenderness over the spinous processes of the vertebræ. Puncture of the cerebellum negative. Two days later, general convulsions, but especially of the right side. Repeated punctures of the right cerebrum, negative. Two days later, death. DENKER.

144. Linser has observed two fatal cases after one-sided ligation of the jugular and emphasizes that one-sided ligation of the jugular vein in the presence of insufficient development of the other vein may produce death from cerebral œdema. HÖLSCHER denies this statement and claims that a brain which has recovered from the occlusion of a thrombosed sinus without injury, cannot further be injured by ligature of the jugular vein. DENKER.

145. The author recommends the following procedure to prevent the extension from a diseased sinus in a backward direction, and to insure incision of the sinus in bloodless condition. The sinus is exposed, not only downward but also 2 *cm* back of the knee. The incision begins at the posterior end of the wound in the healthy sinus, continues downward and forward, the bleeding behind the beginning of the incision being arrested by a tampon pressed upon the outer sinus wall. The author has employed this method with success. DENKER.

146. Of the three additional fatal cases, the first succumbed to a diffuse purulent meningitis and a secondary thrombosis of both cavernous sinuses. The infection extended from the original focus along the diseased osseous veins to the posterior surface of the petrous bone, where a purulent pachymeningitis developed which led to general meningitis. In the second case, death resulted, probably from uræmia. The third case was that of a boy thirteen years old, where facial erysipelas after deep cervical abscess had produced middle-ear suppuration with a fatal meningitis and sinus thrombosis by extension along the middle meningeal vessels. The article concludes with the statement of the indication for operation to date, the condition before operation, the course and length of treatment, and the hearing before and after operation of all of the 75 cases. DENKER.

147. VIERICK, after a review of the literature based on a series of cases operated on at the Leipzig Clinic, considers ligature of the jugular vein to be without danger, and that this ligature should precede sinus operation. Of 40 cases treated with ligature, 15 per cent. died. In 30 per cent. after ligature, metastases were formed. In 54 treated without ligature, 24 per cent. died; in 49.4 per cent., metastases developed. BRÜHL.

148. A brief synopsis of this instructive case is as follows: The patient had never suffered from any disease except gout and rheumatism. After light exercise he complained of chilliness, which developed later into a severe rigor lasting over an hour, followed by a temperature of 104° F. Headache occurred in forty-eight hours over the whole right side of the head and grew excruciating; severe neuralgia of the fifth nerve was present in addition for five days. A retropharyngeal abscess on the right side developed which was opened and drained. The mastoids were separately examined and the ear-drums inspected with negative results. Transillumination of the accessory sinuses showed

nothing abnormal. Without any warning, and without any discoverable local disease, a discharge of at least two drachms of dark pus came from the right ear, relieving the head symptoms very much. Paralysis of the right leg developed shortly after this, and was followed by a convulsion. An exploratory cranial operation discovered nothing definite. Death from exhaustion. ***Autopsy:*** Skull-cap adherent over longitudinal sinus; sinus filled with a septic clot. Blood-vessels of the dura and pia were thrombosed over at least 6 *cm* of the upper surface of the left hemisphere nearest the longitudinal sinus. Both lateral and both sigmoid sinuses were filled with pus and broken-down clots. No disease of the external auditory canal, but the petrous portion of the temporal bone was honeycombed. The analysis distinctly points to a forgotten early middle-ear suppuration, the antrum being the primary focus of infection. CLEMENS.

149. From clinical observation and a careful study of more than 6000 cases of acute infectious disease, it is found that the development of acute purulent otitis media occurs in scarlet fever in about the proportion of one case in five, in diphtheria about one case in ten, and in measles about one case in twenty. In purulent otitis complicating scarlet fever, the discharge is usually, although not always, delayed until the second or third week, after the acute febrile stage has passed. Its development is then suggested by a sharp rise in temperature, which is a symptom of greater regularity and significance than pain. The otitis of diphtheria seems to be less severe than that of scarlet fever, but more severe than measles. Inflammation of the tympanum is more likely to occur during the acute febrile stage of diphtheria and measles, a sudden rise of two or three degrees above the usual temperature suggesting this complication. A combination of measles with diphtheria or scarlet fever always increases the danger, nearly one half of such cases developing a violent double otitis which frequently invades the mastoid cells in spite of vigorous efforts to arrest its advance.

In children under five a post-auricular swelling due to an escape of pus through the Rivinian fissure has been the invariable rule. In children up to ten years of age it is not uncommon to find a post-auricular swelling due in older ones to a perforated cortex. Post-auricular swelling in cases over twelve years is more likely to be due to inflammation in the external auditory canal than to mastoiditis. In all cases a sagging of the posterior superior segment of the external auditory canal wall was invariably present. CLEMENS.

150. The patient, male, aged twenty-three, suffered from purulent otitis media in the left ear since childhood. Mastoid tenderness and pain down the neck developed for the first time several weeks prior to coming under observation. A mastoidectomy showed the external table to be very thin, the cells slightly carious, and containing considerable pus. Three days after the mastoid operation, double vision of the homonymous variety developed, the right eye becoming almost paralyzed. An investigation of the wound was determined upon. The sigmoid sinus was exposed but not aspirated, and no pus was found coming from a deep source. Six days later pus was seen oozing from an opening in the bone. This sinus was investigated at another operation and was found to lead to an abscess cavity which was opened up and thoroughly drained. Meningitis developed four hours after, and the case died in twenty-four hours.

Autopsy.—Dura slightly injected but not adherent to brain surface at any point. No evidences of any bone necrosis nor of dural inflammation. On the under surface of the left lateral lobe of the cerebellum a circular opening was found which led to a small cavity containing exudate, whether purulent or due to breaking-down of the softened tissue is not known. CLEMENS.

151. The symptoms, diagnosis, pathology, and treatment of infective sigmoid thrombosis due to extension of middle-ear suppuration are most carefully described by DUFOUR in this paper. He believes that chronic suppurative otitis media is more liable to cause intracranial complications through the impaired resistance of the tissues and destruction of the accessory cavities than acute suppurative otitis media, since in the latter class of cases the periosteum acts as a protection against bacterial invasion, further aided by the leucocytes destroying the action of the microorganisms. As to the question whether the antrum or sinus should be first operated upon, the symptoms should be the guide; yet, as the infection is due to extension of middle-ear suppuration, he believes that the antrum should be opened first and thoroughly cleaned out. CLEMENS.

152. In describing the usual technique in mastoid operations, the writer has discarded gowns and aprons which render the operator overwarm, and advises the substitution of a sterilized linen suit with canvas slippers and a sterile cap for the usual outer

clothing worn at such times. The incision should be free and as close to the auricle as possible. The periosteum should be carefully cut through, lifted from the field of operation, and accurately replaced over the raw bone surface. He expresses his partiality for the trephine to make a good start, and prefers the one-half-inch Galt instrument. Sterilized sponging will do away with the necessity of irrigation, which has some disadvantages. The cranial cavity and the lateral sinus should be inspected under strict asepsis to be sure of their non-involvement. CLEMENS.

153. In his concluding remarks, RANDALL says that in acute as in chronic cases very extensive intracranial penetration of pus can be present with minimum symptoms; and this not only in those patients with an extra-thick mastoid cortex, which hinders ready breaking outward of the empyema, but in some in whom the yielding of this part of the bone has been exceptionally quick. Free incision of the soft parts may be reserved for the cases with fluctuation; it should then be employed as a step to the duly thorough exploration of the bony structures, without which the surgeon leaves himself in needless darkness as to the real condition and dangers of his patient. The antrum should be freely opened in the acute cases; *all* of the tympanic cavities in the chronic, not only for drainage, but for full inspection of the walls; and every portion of diseased or decidedly suspicious bone curetted away. If this should lead the operator through the inner table to the dura, instead of shrinking from such intervention he should follow the clue without any hesitation. Extradural abscess well evacuated is wonderfully harmless, but it is the cause of many of the most serious or fatal of the intracranial extensions of tympanic suppurations. CLEMENS.

d.—OTHER MIDDLE-EAR AFFECTIONS.

154. **Jacobson.** Treatment of dry middle-ear affections, especially with the pressure probe. *Klin. Vorträge* (Haub's), vol. iv., 5, 1901.

155. **Dunn, John.** A case of severe mastoid neuralgia. *Virginia Semi-Monthly*, April 12, 1901.

154. JACOBSON gives a historic survey of the development of treatment with the pressure probe. He is still of the same opinion as in 1890 regarding the value of the pressure probe in treating the symptoms produced by dry middle-ear affections. He is in favor of the old hand probe and prefers it in cases where the air douche alone is unsuccessful. If the hearing is not improved

after applying the pressure probe, the use of the catheter is immediately resorted to. If this also fails, Jacobson employs pneumomassage and precedes it either with the air douche or the pressure probe. BRÜHL.

155. Of the five cases reported, the most interesting is the following: Three separate and distinct attacks of pain developed in the mastoid and surrounding region as a result of taking cold, and in none of these attacks did any inflammation of the mastoid or middle-ear show itself. The mastoid pain grew more severe at each subsequent attack. Examination of the nose and throat threw no light on the case. After six months of suffering, the pain subsided somewhat, only to return with any exposure or whenever the patient took cold. The mastoid was not only spontaneously the source of pain, but under pressure excessively sensitive, especially over the middle third, which was more sensitive than either the region of the fossa or the tip. The temperature, which for the first three or four days was slightly above normal, became subnormal for five days, reaching as low as 96½° F. The pulse was good. The administration of salicylate of soda, on the supposition of the rheumatic diathesis playing the exciting factor in the case, controlled the pain for a short time, but later it was without effect. The pain now became so severe that a mastoid operation was determined upon.

The cells were found to contain nothing but air; those of the upper and lower thirds of the process were normal in color; those occupying the middle third were markedly injected. This injected area corresponded with the sensitive area on pressure. Nowhere was there any visible exudate to be found. The wound was sutured and healed by first intention. The neuralgia disappeared with the operation. CLEMENS.

NERVOUS APPARATUS.

156. **Hammerschlag.** Rheumatic affections of the auditory-nerve apparatus. *Arch. f. Ohrenhlk.*, vol. lii., p. 1.

157. **Spira.** On concussion of the labyrinth. *Klin. Vorträge* (Haub's), vol. lii., p. 1.

156. The author has been able to collect twelve cases from literature and reports on two personal observations of rheumatic affection of the auditory-nerve apparatus. He believes that in this disease the auditory nerve is injured by the refrigeratory poison which may in one case be irreparable, causing permanent damage

to the ear and functions of the semicircular apparatus, and in other cases may disappear completely. The reason for the varying intensity of the injury, as well as for the localization of the pathologic changes, is as yet unknown. DENKER.

157. With due consideration for anatomic and physiologic observations, SPIRA describes those functional disturbances of the labyrinth in which neither macroscopically nor microscopically anatomical changes can be demonstrated, and where we have to expect a purely functional alteration as explanation. He believes that the true cause of these changes is an alteration in the constructions of the neurons. Diagnosis and treatment are extensively dwelt upon and should be read in the original. Spira recognizes great value in hearing exercises. BRÜHL.

NOSE AND NASO-PHARYNX.

a.—METHODS OF EXAMINATION AND TREATMENT.

158. **Baurowicz.** Lysol for disinfection and to prevent clouding of laryngeal mirrors. *Arch. f. Laryngol.*, xi.

159. **Ostmann.** The use of the galvano-cautery in the nose as a preparatory step to intranasal operations. *Deutsche med. Wochenschr.*, No. 14, 1901.

160. **Lichtwitz.** The treatment of several nasal disorders with hot air. *Ann. des maladies de l'oreille.*, etc., April, 1901.

161. **Menier.** Hot-air treatment in general and in particular in rhinology. *Bordeaux*, Cadoret, 1901.

162. **Mayer, Emil.** Clincal experience with adrenalin. *Philad. Med. Jour.*, April 27, 1901.

163. **Goldstein, M. A.** A new technique for the reduction of turbinal hypertrophies. *The Laryngoscope*, May, 1901.

164. **Ingals, Fletcher.** Notes on adrenalin and adrenalin chlorid. *Jour. Amer. Med. Assoc.*, April 27, 1901.

158. The method of Ruprecht of immersing mirrors in 0.5 % lysol solution to prevent their clouding has been found of value by the author. In place of lysol, a solution of bacillol, 0.25 to 1.00 %, is used. Disinfection is best obtained by boiling.

ZARNIKO.

159. In operations on the septum and turbinals to prevent hemorrhage and subsequent packing, OSTMANN draws furrows with the galvano-cautery burner behind and above the operative area. This is supposed to obliterate the descending vessels, and can be used in removing hypertrophied ends of turbinates, the entire turbinates, cartilaginous and bony spurs, as well as in treating hemorrhage from the anterior parts of the septum.

NOLTENIUS.

160. The introduction of hot, dry air, from 70–90°, into the nasal cavity by the apparatus of Lermoyez-Mahu modified by LICHTWITZ is followed with good results in vasomotor coryza and acute hypertrophic rhinitis. In five to ten sittings of three minutes' duration a permanent cure is obtained. The author has not observed a single complication in 180 sittings. BRÜHL.

161. The advantages of this method for rhinology are demonstrated by the case histories of thirty-two patients from Lichtwitz's clinic. This author has also had favorable results. BRÜHL.

162. Adrenalin is the isolated blood-pressure-raising principle of the suprarenal gland, isolated by Dr. Jokichi Takamine in five different crystalline forms. In solutions of from 1:1000 it blanches the nasal mucous membrane in a few seconds. The impurities occurring in solutions disappear upon the addition of a small amount of chloretone. Adrenalin was used as a hæmostatic, also in operations, for the relief of nasal congestion, as a diagnostic aid, and in acute vasomotor rhinitis, with good result. M. TOEPLITZ.

163. After arguing the different methods of reduction, such as turbinotomy, partial or complete, by saw, scissors, snare, or spokeshave; the cautery, both chemical and electric; the use of astringents and caustics by swab and spray, GOLDSTEIN advocates a modification of Pierce's submucous cauterization with chromic acid, introduced through a trocar as far as the bone parallel to the turbinate. M. TOEPLITZ.

164. Adrenalin chlorid in solutions of from 1 : 5000 is of great value in the treatment of acute inflammatory affections of the nose, in those of from 1 : 1000 for the throat and epistaxis. It is used in a spray. M. TOEPLITZ.

b.—GENERAL SYMPTOMATOLOGY AND PATHOLOGY.

165. **Gorschkow.** On the localization of the sense of smell in the cerebral cortex. *Obosrenje psichiatrii*, Jan., 1901.

166. **Suarez de Mendoza.** A case of nasal vertigo cured by bilateral removal of a septum spur. *Arch. de méd. et de chir. speciales*, July, 1901.

167. **Flatau.** Prophylaxis in diseases of the throat and nose. Nobeling-Flatau, *Handbuch der Prophylaxe*, Abth. vii.

165. The author has in general been able to confirm the results of previous investigators. The centre of smell lies in the gyrus hippocampus and uncinatus posterior; the cornu ammonis

appears to be but little involved. Faradic irritation of this area produces a distinct reflex in the shape of contraction of the corresponding nostril. This area has nothing to do with the centre for taste. SACHER.

166. The patient, thirty-two years of age, suffered from influenza after otitis five years ago. The otitis was cured. Severe attacks of vertigo remained, which set in whenever the patient took cold. Quinine, the bromides, and iodine were without effect. Examination showed the mucous membrane of the nasal turbinals to be hyperæmic and hypertrophied. Application of boric acid, menthol, and cocaine caused the vertigo to nearly disappear. Removal of the spurs was followed by cure.

HARTMANN.

167. The author describes the general [prophylaxis of speech and prophylaxis as regards the nose and throat in acute infectious diseases and in hemorrhages. BRÜHL.

c.—OZÆNA.

168. **Pasmanik.** On the pathogenesis of ozæna. *Revue médicale de la suisse romande*, No. 4, 1901.

168. The various theories of this action are fully discussed. There are at present two opposing views, the one of Zaufal-Hopmann, the other of Loewenberg-Abel-Strübing. The former depends upon congenital predisposition from peculiar anatomical relations, and the latter, on the action of pathogenic organisms. According to the author, a combination of both theories explains all the conditions of the disease. Kaiser in Breslau has confirmed the views of Zaufal-Hopmann, inasmuch as he has demonstrated by measurements the presence of platyrrhinia and brachyprosopia in ozæna patients. Siebenmann and his pupils have come to the same conclusions. In 20 ozæna patients of different nationalities, examined by the author, 15 were found to be platyrrhinic. In these the ozæna was most pronounced and had appeared in earliest youth. In a family all of the sons resembling the father were platyrrhinic and suffered from ozæna, while the daughters, resembling the leptorrhinic mother, were healthy. The metaplasia of the mucous epithelium, first demonstrated by Schuchardt, occurs most frequently in platyrrhinic noses. There are, however, unquestionably, cases of severe ozæna where there is no platyrrhinia. The treatment should occur generally between the second and eighth years; at

that time there is some prospect of a result, and the occurrence of a fœtid odor may be prevented. Treatment can do nothing for the atrophy of the mucous membrane with the loss of smell.

SCHWENDT.

d.—NEW GROWTHS.

169 **Barrago-Ciarelli.** On mucous polyps of the septum. *Giornale Internazionale della Sc. mediche*, Anno xxii.

170. **Treitel.** On distension of the bony nose by benign nasal polypi. *Arch. f. Laryng.*, xii.

169. This very complete article contains a history of the pathology, etiology, and symptomatology of mucous polyps of the nasal septum, which, according to the author, occur very rarely. He personally observed and operated on a case, with complete histological description. RIMINI.

170. A description of a case where a great number of nasal polypi produced an unusual distension of the nasal cavities. According to the author, this probably took place between the sixth and fifteenth years, during which time the bony nasal framework grows most. These cases are not so rare as they are considered. The reviewer has seen a number; one in particular was associated with a combined empyema of the accessory cavities. Gerber has described a number of similar cases. ZARNIKO.

e.—ACCESSORY SINUSES.

171. **Panse.** A case of tuberculosis of the maxillary and sphenoidal sinuses. *Arch. f. Laryng.*, xi.

171. At operation tuberculous masses were found in the maxillary antrum, frontal, ethmoidal, and sphenoidal sinuses. At autopsy, tuberculosis of the ethmoid and anterior sphenoid were found present. The roof of the sphenoidal cavity was intact.

ZARNIKO.

f.—OTHER DISEASES OF THE NOSE.

172. **Delie.** Lupus of the nose. *Bulletin de la Soc. belge d'otologie*, etc. fifth year, No. 1.

173. **Lewy.** A striking condition of the nerves in the nasal mucous membrane in nasal reflex neuroses. *Arch. f. Laryng.*, xii.

174. **Spiess.** A new viewpoint in treatment of acute coryza. *Arch. f. Laryng.*, xii.

175. **Gerber.** On the upper respiratory passages and the occurrence of the lepra bacillus. *Arch. f. Laryng.*, xii.

176. **Booth, Burton S.** A combined intranasal and extranasal operation for the correction of a congenital concave vertical and lateral deformity of the nose. *N. Y. Med. Journ.*, April 27, 1901.

177. **Roe, John O.** The correction of the deviations of the nasal septum with special reference to the use of the author's fenestrated comminuting forceps. *N. Y. Med. Journ.*, April 13, 1901.

178. **Freudenthal, W.** Primary chancre of the septum of the nose. *N. Y. Med. Journ.*, May 11, 1901.

172. Lupus of the nose occurs in two forms, the lupus erythematosus, whose tubercular nature is not established, and the tuberculous lupus vulgaris. After a brief anatomical description, an unusually complete critique of the general and local treatment follows. The latter consists principally in mechanical destruction of the lupus nodules with curette, scarification, galvano- and thermo- cautery, chemical destruction by various salves, Elsenberg's parachlorophenol and pyrogallic acid. Finsen's phototherapy and treatment by the X-ray, the electric treatment, Hollander's hot-air treatment, treatment with subcutaneous injections of anti-toxines and other medicaments, and surgical radical treatment are discussed. A large number of illustrations furnished by Prof. Finsen confirm the curative action of his treatment. A number of photographs from the clinic of Dr. de Nobele show the results of the X-rays. The latter treatment has this advantage over Finsen's, that a larger area can be treated at a time; photo-therapy, however, is painless. Up to the present both forms of treatment are inapplicable to the nose. According to Hollander's method, air heated to 300° is blown from a tube over the diseased area. The advantage of this is that any part of the body can be reached. The treatment is somewhat tedious and the pain occasioned requires the use of an anæsthetic. Injection of Koch's tuberculin nowadays serves only for purposes of diagnosis. Of the various subcutaneous injections, that of calomel seems to be the only one which has caused a complete cure. This procedure can be readily combined with any of the other treatments. Surgical treatment by excision, suture, plastic operations, and transplantation of skin, is especially suitable in circumscribed affections and has the advantage of rapid healing; but destroyed nasal mucous membrane cannot be restored by any plastic operation. The subsequent atrophy of transplanted skin flaps in addition to the trophic changes following these operations are unfavorable. SCHWENDT.

173. The author has examined histologically two pieces of mucous membrane from two patients suffering from distinct nasal neurosis. The presence of nerve fibres was looked for and he

believes that he found an unusual quantity of nerve fibres situated beneath the mucous surface. After study of the illustrations this view does not seem conclusive to the reviewer. It is necessary to control these findings with other examinations.

ZARNIKO.

174. The author believes that the general aim of treatment in acute coryza is to reduce the reflex instability of the nasal and pharyngeal mucous membranes. For this purpose he recommends the administration of salicyl and antipyrin and the insufflation of orthoform into the nose several times a day until the discomfort and the secretion cease. ZARNIKO.

175. This extensive article is divided into three parts. In the first, the history of lepra is considered, with special regard to its occurrence in the upper air passages. Among other things it is stated that over 200 years ago the supposition was pronounced that the primary seat of the lepra infection was the nasal mucous membrane. The second part gives the histories of eight cases of lepra observed by the author, with excellent and accurate illustrations. The author then presents a very readable picture of lepra in the nose, throat, and lungs. The last part reports pathological examinations regarding the infectiousness and tendency to spread of lepra. Most of the bacilli were found in the nasal secretion, which is supposed to be immediately destroyed in the handkerchiefs used. ZARNIKO.

176. The operation for deviated septum is, on principle, the same as that devised by Ash, only the incisions are made with bistouri and saw, and with cocaine and suprarenal extract; for plugging tannic acid gauze is used in addition to the splint. The saddle-shaped deformity is corrected under an anæsthetic by an incision extending from the glabella to the nasal tip, by detachment and elevation of the nasal bones, and by packing the nostril. A suture is then carried around the parts by means of a curved needle armed with catgut, making a circuitous course and passing along either side and once across the dorsum and is tied to fill in the depression; the incision is closed by subcutaneous stitches.

M. TOEPLITZ.

177. ROE incises the septum obliquely, vertically, or horizontally, and in two of these directions combined, without piercing the mucous membrane of the concave side. He then uses his fenestrated forceps, which also breaks the osseous attachment,

and finally introduces sterilized cotton or gauze around a small metal plate as a support in the previously occluded side.

M. TOEPLITZ.

178. The lesion occurred in a physician who, owing to dryness of the nose, was used to pick it, and had thus infected the septum after a vaginal examination of a syphilitic patient. It started as a small ulceration on the right side of the septum and was not at first recognized as specific, until all the glands from the frontal bone down the neck on both sides had become involved and the edges of the ulcer were quite elevated.

M. TOEPLITZ.

g.—NASO-PHARYNX.

179. **Fischenich.** Syphilis of the naso-pharynx. *Arch. f. Laryng.*, vol. xii.

180. **Touton.** Remarks on the preceding article. *Arch. f. Laryng.*, vol. xii.

181. **Hellat.** Three cases of naso-pharyngeal tumors. *St. Petersburger med. Wochenschr.*, 1901, No. 30.

182. **Holmes, Christian R.** Accidents attending adenoid operations. *The Laryngoscope*, May, 1901.

183. **Shurly, E. C.** Remarks on the after-effects of operations for the removal of adenoid tissue at the vault of the pharynx. *Jour. Amer. Med. Assoc.*, May 11, 1901.

179. In 235 cases of syphilis in the ear, nose, and throat, the nose was involved in 82, and of these 82 the naso-pharynx in 49. In these 49 cases of naso-pharyngeal syphilis, this organ alone was diseased in 14, in the other 35 there were other evidences of the disease. The author has never observed primary infection, and secondary symptoms but once. In other cases tertiary symptoms were always present.

The greatest number occurred in the first six years after infection, the earliest after two or three months, and the latest after twenty-two years. The author is opposed to the view of some clinicians and thinks that naso-pharyngeal syphilis presents a precise clinical picture. He finds that severe pain of unusual persistence and severity is also present in the neck, interfering greatly with the nutrition of the patient. Severe headache, intense pressure in the entire head, stupor, and sometimes pain in the ears, enormous discharge, disturbance of digestion from swallowing the discharge, with consequent weakness and occasional fœtor, are other symptoms. To ensure exact diagnosis, a pharyngeal mirror is employed. Treatment does not consist only of mercury combined with iodine, but careful local treatment is indicated. Cleansing of the surface of the ulcers and insufflation of equal parts of calomel and orthoform, with the application of a mixture of iodine, potassium iodide, and glycerine, are used. Forty-nine case histories are given. ZARNIKO.

180. The author speaks of the importance of the technique of the pharyngeal examination for dermatologists in order that they may not overlook pharyngeal syphilis. Patients with naso-pharyngeal syphilis belong to the most thankful class. Treatment is not only general but local. ZARNIKO.

181. CASE 1.—Cyst of the naso-pharynx in a middle-aged woman, on the posterior surface of the soft palate at a point contiguous to the lateral wall of the choana. The tumor was as large as a plum, of blue color, with a smooth surface. On attempting to remove the mass with a cold snare through the nose, the capsule ruptured and serous fluid escaped. Capsule retracted. Complete healing.

CASE 2.—Cystic degeneration of Luschka's tonsil in a patient forty-three years old, with obstructive rhinitis. Posterior rhinoscopy revealed on the pharynx two distended tumors the size of cherries. These were removed with adenoid curette. The rhinitis and chronic eczema of the lip ceased after the operation.

CASE 3.—Carcinoma of the naso-pharynx. A flat tumor with small lobules like granulations, hard, easily bleeding, occupied the entire posterior wall. At the operation with Hartmann's adenotome, profuse hemorrhage. Tumor shortly recurred. In the course of the disease bilateral compression of the recurrent laryngeal occurred ; first the left then the right vocal cord was paralyzed. Shortly after, paralysis of the superior laryngeal nerves followed ; death ensued after six months. SACHER.

182. During an operation for the removal of adenoids in a child, aged eight, performed under chloroform, the sharp portion of a Gottstein curette broke off in the vault of the pharynx at the first stroke. The end of the blade, terminating in a sharp hook-like process, was pressed into the flesh of the index finger and then quickly dragged over the soft palate. In another child, five years old, operated without an anæsthetic, the broken-off piece, ½ in. long and $\frac{1}{16}$ in. wide, was swallowed, but three days later passed through the rectum without any discomfort.

M. TOEPLITZ.

183. The untoward effects of removal of adenoids may be classified as immediate: Hemorrhage, only in hemophilia; injury to pharynx; reactionary inflammation affecting the pharynx, larynx, tonsils, ear, and accessory cavities; sepsis; and as remote: Erisypelas and peritonsillitis: regrowth of adenoids will occur even after the most thorough removal.

M. TOEPLITZ.

SOFT PALATE, PHARYNX, AND BUCCAL CAVITY.

184. **Hallat.** Streptotrix tonsillitis. *Jeshenedelnik*, 1901, Nos. 18 and 19.

185. **Manges, Morris.** Typhoid fever and pharyngeal diphtheria. *American Medicine*, June 1, 1901.

186. **Goodale, J. L.** Pathology of the so-called neurotic inflammations of the mouth. *Annals of Otol., Rhin., and Laryng.*, May, 1901.

187. **Keshner, Moses.** A case of membranous angina, dure to streptococci, followed by paralysis of the soft palate. *Medical Record*, June 1, 1901.

184. According to the investigations of the author, tonsillar concretions consist of pure cultures of a fungus, probably of the leptothrix order. These should not therefore be regarded as completely indifferent structures. They cause local irritation and a number of reflex symptoms in organs situated about the tonsils. Characteristic of this disease is its intermittent course and distinct improvement after removal of the concretions. The best treatment is incision of the crypts containing the concretions. In obstinate cases, amputation of the tonsil is indicated.

SACHER.

185. MANGES confirms, from four fully reported cases of his own experience, the views of older clinicians of the occurrence of true diphtheria associated with typhoid fever by the presence of Klebs-Loeffler bacilli and the good effect of antitoxine, except in one case which was fatal. He also describes oval pharyngeal ulcers which appear during the early stages of the disease, symmetrically on the anterior pillars of the fauces. M. TOEPLITZ.

186. GOODALE groups the so-called neurotic inflammations of the mouth under the following divisions: 1. Herpes zoster. 2. Herpes buccalis and lingualis, herpes facialis, erythema exsudativum multiforme or bullosum. 3. Erythema nodosum, purpura rheumatica. 4. Stomatitis neurotica chronica of Jacobi. 5. Dermatitis herpetiformis of Duhring (of doubtful position). 6. Pemphigus,—which he examines critically from the literature and studies from his own cases. M. TOEPLITZ.

187. The patient, æt. twenty, a female, presented the tonsils, uvula, and anterior and posterior pillars of the fauces covered with a thick, dirty, yellowish-gray, tenacious membrane. A smear from the same showed short-chained streptococci, but no Klebs-Loeffler bacilli. A culture on blood serum produced almost a pure growth of streptococci. The symptoms were of local diphtheria and systematic infection with maniacal delirium lasting three days. The membrane disappeared on the fourth day ; on the fifth, paralysis of the soft palate occurred, which began to improve only after several weeks. M. TOEPLITZ.

BOOK NOTICES.

VI.—**The Accessory Sinuses of the Nose, their Surgical Anatomy, and the Diagnosis and Treatment of their Inflammatory Affections.** By A. LOGAN TURNER, M.D. Published by W. Green & Son, Edinburgh, 1901. Pp. 211. Price, 12*s. net.*

This is the first book on the accessory sinuses by an English author. Dr. Turner, in addition to his own original researches along certain lines pertaining to this subject, has had the advantage of having the unusually valuable anatomical material for which Edinburgh is noted, at his disposal. The anatomical part, comprising the greater half of the book, is admirable ; the subject-matter is lucidly written and illustrated by forty excellent full-page plates. The outer wall of the nasal cavities is first described, then each sinus is taken up separately. Due attention is paid to the surgically important anatomical peculiarities and to topographical relations. The next chapter treats of the communication between the sinuses and the nose and the methods of probing. Considerable space is devoted to the comparative anatomy of the frontal sinus in man. The author has examined the frontal sinuses in 578 skulls belonging to various races, chiefly by aid of transillumination, and furnishes very interesting comparative figures. In 27.1 per cent. one or both sinuses were absent ; the septum occupied the mesial plane in 77 per cent. The subject of transillumination in sinus disease is treated quite exhaustively. In maxillary disease the author, agreeing with most clinicians, regards the test as only corroborative, while in suppuration of the frontal sinuses as of little aid in diagnosis but useful to outline the cavity, as suggested by Kuhnt, which is of considerable value in the question of external operation. The final chapters of the book are devoted to the clinical part of the subject, treating of the etiology, pathology, diagnosis, and treatment. This part gives a more or less accurate and concise idea of our present knowledge of the clinique of the accessory-sinus suppurations.

At the same time, it may perhaps be said that this part is a little too brief, especially if compared with the anatomical part, a fault, if such it may be called, which will surely be remedied with successive editions. We cannot abstain from complimenting the author and thanking him in the name of all English-speaking students for furnishing the means to become acquainted with the intricate and important anatomy of the accessory nasal cavities, for which our text-books on anatomy or rhinology can be searched in vain. A. K.

VII.—**Manual of the Diseases of the Ear.** By THOMAS BARR, M.D. Third Edition. Published by J. Maclehose & Sons, Glasgow, 1901. Pages 241.

Dr. Barr's deservedly popular manual has reached a third edition. Among the changes we find that the chapters dealing with the consequences of purulent disease of the middle ear and their operative treatment have been considerably enlarged to keep pace with the better interpretation of these diseases and the constantly improving methods of treatment.

The book continues to be one of the best in line, handy and yet complete. A. K.

VIII.—**Diseases of the Nose and Throat.** By F. DE H. HALL and H. TILLEY. Second Edition, 1901. Published by H. K. Lewis, London, and P. Blakiston's Son & Co., Philadelphia. Pages, 605. Price, $2.75.

This, the second edition of this work, has been enlarged by fifty pages and the subject-matter brought up to date. The description of the methods of examination precedes a complete clinical picture of the various affections of the nose, pharynx, and larynx. Diseases of the accessory sinuses occupy an important part of the book and have received considerable attention at the hands of the authors, one of whose names is associated with the advancement of our knowledge of this interesting group of affections. The book can be heartily recommended as a guide to students and will be found of service to all workers in these special lines. A. K.

IX.—**International Directory of Laryngologists and Otologists.** Compiled by RICHARD LAKE. Second Edition. London: Rebman, Limited, 1901. Price, 5*s*.

The directory, in its new form, has been considerably enlarged, and many of the errors occurring in the names and addresses, especially of the German, have been corrected. The book serves many useful purposes to specialists. A. K.

X. — **Surgical Anatomy and Operative Surgery of the Middle Ear.** By A. BROCA, Professor of Surgery in Paris. Translated by M. YEARSLEY, F.R.C.S. London: Rebman, Limited. 1901. Pages 62. Price, $1.00 net.

The first part of this monograph gives a description of the external form and structure of the temporal bone, antrum, aditus ad antrum, attic, and their topographical relations. The second part deals with operative procedures in the following four main groups: 1. Simple opening of the mastoid. The author recommends in all cases first to locate the antrum by making an opening of 1 *cm* square with the chisel at about a centimetre behind the upper part of the meatus and then to expose all communicating cells. No mention is made of the importance of removing the mastoid tip in certain cases. 2. Opening the mastoid and tympanum. A description of the usual, so-called radical operation. The retro-auricular wound is kept open, the membranous canal is divided up and back into the concha, and the gauze dressings are introduced through both openings. It is not stated when the posterior wound should be allowed to close, or whether a permanent fistula should be left. 3. Stacke operation. 4 and 5. A summary and rather cursory description of the operations for the more usual intracranial complications. The author is a great advocate of the Stacke protector and mentions its use in both simple and radical operations.

The remainder of the book is styled " The Atlas," and comprises two parts. In the first the relations of the middle-ear cavities are illustrated by drawings of sections through the temporal bone with text. The drawings are from photographs, but unfortunately not very clear. In the second part the various steps of the usual operations are illustrated by diagrammatic drawings.

A. K.

XI.—**A Treatise on the Diseases of the Ear, including the Anatomy and Physiology of the Organ, together with the Treatment of the Affections of the Nose and Pharynx which Conduce to Aural Disease.** By T. MARK HOVELL, F.R.C.S. Edinburgh, M.R.C.S. England, Aural Surgeon to the London Hospital. Second edition. Philadelphia: P. Blakiston's Son & Co., 1901 (printed in Great Britain). Price $5.50.

The anatomo-physiological introduction occupies 68 pages, with 20 illustrations in the text, clear and neat, but all borrowed. The anatomy and physiology of the inner ear occupies, with 2 figures, pp. 648–667.

This is a most carefully prepared and very well gotten-up text-book, entering into the minutiæ of daily practice in such detail of description and advice as if a painstaking and experienced teacher stood behind the reader guiding his hand and giving the reasons for his precepts. At some places the rules stated would seem superfluous for a pupil of average mental capacity—for instance in Chapter VI. on syringing the ear (p. 147): "The patient should hold the bowl or trough in such a manner as to prevent the fluid from running down the neck and wetting his clothes." Yet it is a small fault to be too explicit. This punctiliousness is a feature of the whole book and, no doubt, any aural surgeon that reads it will receive many a useful point for his practice.

In perusing the book there are many remarks, derived from the author's practice, which deserve to be carefully considered. For instance, the remarks on the removal of adenoids and tonsils, p. 309, etc.: An anæsthetic should always be given, as the author is of opinion that the operation cannot be thoroughly done whilst the patient is conscious, and as in most cases it is necessary to snare off the posterior extremity of each inferior turbinated body. For several years the author has systematically taken away these enlarged extremities, for he had noticed that nasal obstruction frequently remained, although all the adenoid growth had been carefully removed. Further examination showed the prevalence of enlargement of the posterior extremity of the inferior turbinated body, and led to the practice of its systematic removal. The different chapters of Hovell's treatise are carefully written, with the evident and successful endeavor to present everything useful with such accuracy and clearness as to enable the reader to diagnosticate, prescribe, and operate understandingly even in those affections with which he is not very familiar. The intracranial complications of acute and chronic tympano-mastoid suppurations are perhaps not sufficiently described.

As a whole Hovell's text-book is a reliable guide for study and reference for the conscientious aural practitioner, and as such it will command and hold a large circle of readers. H. K.

Obituary.

HERMANN STEINBRÜGGE.

In August, 1901, **Hermann Steinbrügge** succumbed to pulmonary disease of many years' standing. In him otology has lost a worthy investigator, these ARCHIVES a zealous collaborator, and many colleagues a true friend. His work in otology belongs to his mature years, so that his scientific papers from the beginning were finished and clear in conception.

Born in Hamburg, 1831, he graduated in Heidelberg, 1854. After eighteen years of general practice in his native city, he was forced to move to the milder climate of Madeira, on account of poor health. He returned in 1876, and, unable to continue the exigencies of general practice, he devoted himself to the study of otology under the guidance of Moos. Together with the latter he published a number of excellent papers, especially on subjects relating to the pathology of the ear. He became a lecturer in the Heidelberg University in 1881, and four years later in Giessen, where he was the first to give an independent course on otology. He was soon after elected extraordinary professor, and the ear clinic, started by his private means, was taken over by the State. In 1898 his professorship became official and salaried.

Almost all of Steinbrügge's contributions have appeared in these ARCHIVES. He wrote the chapter on the pathology of the ear in Orth's text-book, which is an unusually clear and complete review of the subject, based to a great extent on original work. In 1895 he published, together with Niessen, an atlas, entitled *Pictures of the Human Vestibule.*

His life was replete with trouble and work, but the work was a pleasure to him, and his achievements insure him an honorable memory.

O. KÖRNER.

Dr. **Friedrich Semeleder** died October 1, 1901, at Cordova, in the State of Vera Cruz, Mexico. As a friend of Czermak, he studied and practised laryngology and rhinology in Vienna, as one of the first after the invention of the laryngoscope. As early as in the year 1860 he published papers "On the Examination of the Naso-pharyngeal Cavity," and "On Rhinoscopy." His name was best known through the monograph : *Rhinoscopy and its Value in Medical Practiee*, Leipzig, 1862, with illustrations of rhinological conditions considered exemplary even to-day.

Semeleder accompanied Emperor Maximilian as his physician-in-ordinary and chief medical officer of the Austrian Volunteer Corps to Mexico, and remained there until his death.

HARTMANN.

Dr. **Adolf Fick**, Professor of Physiology at Würzburg, Germany, died August 21, 1901, aged seventy-two years. He was a gifted man, well trained, especially in natural philosophy and mathematics, of the school of Helmholtz, Brücke, DuBois-Reymond, and C. Ludwig; he succeeded the latter in the chair of Physiology at the University of Zurich, where the present writer, as a student, had the advantage of his closer acquaintance. He was a witty and very amiable companion. He gave particular attention to the anatomy and physiology of the higher senses. In 1856 he published his *Medical Physics*, in 1860 his *Compendium of Physiology, Including Embryology*, in 1864 his *Treatise of the Anatomy and Physiology of the Organs of Special Sense*. Besides the larger works, he published a number of papers on original investigations. All his works were distinguished by definite, scientific, and practical results, elegant demonstration, and attractive presentation. H. K.

MISCELLANEOUS NOTES.

The city of DORTMUND, Rhine-Province, Prussia, has established a department for Ear, Nose, and Throat Diseases, with an adequate equipment as to a special operative theatre, bathrooms, etc., and twenty beds, eight of which are for private patients. Dr. **Hansberg** has been appointed surgeon-in-charge.

Privatdocent Dr. **Leutert**, of Königsberg, late assistant of Professor Schwartze, has been appointed Extraordinary Professor and Surgeon in Charge of the Otological Clinic at the University of Giessen, to succeed the late Professor Steinbrügge.

Dr. **Kümmel** in Breslau, well known to our readers through his excellent contributions to otology, has declined a call to the chair of otology of the University of Strasburg, to succeed the late Professor Kuhn.

Dr. **Hegner,** Assistant of Professor Passow, has been appointed Privatdocent of Otology at the University of Heidelberg.

Dr. **Hinsberg,** who has distinguished himself by some very excellent papers (for instance on the Diagnosis and Treatment of Otitic Meningitis, in this volume, p. 96, and on Suppurations of the Labyrinth, in the forthcoming number of the German Edition of these ARCHIVES), has settled in Breslau as Privatdocent at the University for Ear, Nose, and Throat Diseases.

The **VIIth International Otological Congress,** which was to be held at Bordeaux in 1902, has been postponed. The exact date will be made known later.

INDEX OF AUTHORS AND SUBJECTS.

VOL. XXX.

Abscesses of Post-Auricular Gland, 44

Accessory Cavities, Empyema of, with Blindness (Halstead), 222; Reports on, 67, 269, 414, 445

ADAMS, Abscess of Temporo-Sphenoidal Lobe, 494; Case Simulating Mastoiditis, 237

Adenoids, Operation for, with Overhanging Head (Rudolff), 199

ALDERTON, Canula for Antrum, 494

ALT, Impairment of Musical Hearing, 373

Anatomy, Reports on, 420, 519

Anchylosis of Incus and Malleus, 156

Antrum, Canula for, 494

Auditory Nerve, Bilateral Paralysis of (Fagge), 133; Fibro-Sarcoma of, 377

Auricle, Operation for Deformed (Whiting), 42

BACON, Auricle Operation, 42; Epileptiform Attacks with O. M. P. C., 497; Non-Operative Cases of Acute Mastoiditis, 7, 46

BARR, "Manual of the Diseases of the Ear," Notice of, 551

BARTH, Mastoid Operations in Constitutional Disease, 344

Basel, Ear and Throat Patients in Hospital at (Sporleder), 15

BATES, Otitis Externa, 394

BERENS, Mastoiditis, 36

BERTHOLD, Entotic Noises, 381

BIEHL, Vestibular Nerve, 379

BÖNNINGHAUS, Whale's Ear, 379

Book Reviews, 177, 277, 452, 550

Brain, Healing of Abscesses of the (Passow), 1

BRAISLIN, Tumor of Middle Ear, 463

BRANDEGEE, Tympanic Vertigo, 205, 258

BRIEGER, Otogenous Sinus Thrombosis, 369

BROCA, Surgical Anatomy and Operative Surgery of the Middle Ear, Notice of, 552

BRUEHL, Histology of Aural Polypi, 334

Carcinoma of Ear (Treitel), 189

Cerebellar Abscess (Phillips), 85, 162, 179

CHEATLE, Deafness with Herpes, 132

Cholesteatoma, Case of Genuine (O. Koerner), 323

COHN, Otogenous Meningitis, 291

Deaf-Mutism, Pathogenesis of (Habermann), 382; Reports on, 402, 434, 523

DENCH, Early Operations in Mastoiditis, 156; Epidural Abscess, 43; Mastoiditis, 241

DENKER, Ears of Monotremata, 378 ; Technique of Intra-Nasal Operations, 332
DENNERT, Simultaneous Tones and Helmholtz's Theory, 379
DEUTSCHLAENDER, Gravitation Otitic Abscess, 374

Ear, Rodent Ulcer of (Freudenthal), 390
EHRENFELD, Otitis Media Purulenta, 387
Electrolysis in Aural Diseases, 140
Encephalocele (Whiting), 39
Entotic Noises (Berthold), 381
Epidural Abscess, 43
Ethmoid, Mucocele of (Mann), 386
Eustachian Catheter, 500
Eustachian Tube, Electrolytic Dilatation of, 61, 73, 140
Examination and Treatment, Reports on, 165, 264, 401, 522
External Ear, Reports on, 166, 403, 425, 524

FAGGE, Bilateral Auditory Nerve Paralysis, 133
FLEURY, CHAVANNE, "The Ear and Hysteria," Notice of, 455
Formaldehyde in Otitis Suppurativa, 429
FREUDENTHAL, W., Rodent Ulcer of Ear, 390
FRIEDRICH, "Rhinology, Laryngology, and Otology, and their Significance in General Medicine," Notice of, 177
Frontal Sinus, Bilateral Empyema of (Wertheim), 387 ; Infection of Meninges from (Hinsberg), 385
FRUTIGER, Function of the Round Window, 181

German Otological Society, Report of Meeting of the, 363
Gland, Abscesses of Post-Auricular, 44
GOERCKE, Caries of the Ossicles, 384
Gravitation Otitic Abscess (Deutschlaender), 374
GRUENING, Abscesses of Post-Auricular Gland, 44 ; Enlarged Tonsil, 239 ; Mastoiditis with Erysipelas, 495 ; Sinus-Thrombosis, 43, 237

HABERMANN, Pathogenesis of Deaf-Mutism, 382
HALL and TILLEY, Diseases of the Nose and Throat, Notice of, 551
HALSTEAD, Empyema of Accessory Cavities with Blindness, 222
HARRIS, Mastoid Fistula, 391 ; Tinnitus, 251
HEAD and ANDREWS, "Year Book of the Nose, Throat, and Ear," Notice of, 177
Hearing, Instruments for Improving the, 243
Hemorrhage, Arterial, from the Ear, 430
HEPBURN, Tinnitus, 242
Herpes, Deafness with (Cheatle), 132
HINSBERG, Eye Disease and Tuberculosis of Nose, and Treatment of the Latter with Lactic Acid, 352 ; Infection of Meninges from Frontal Sinus, 385 ; Otitic Meningitis, 96
HOVELL, Treatise on Diseases of the Ear, Notice of, 553

Influenza, Aural Complications of (H. Knapp), 38

JANSEN, Otogenous Sinus Thrombosis, 364

KENEFICK, Electrolysis in Organized Strictures of Eustachian Tube, 73 ; Otitis Diffusa, 511
KIEN, Otitic Retro-Pharyngeal Abscess, 304
KILLIAN, Thrombo-Phlebitis of Longitudinal Sinus, 314
KIPP, Acute Otitis with Sinus Thrombosis, 496
KNAPP, A., Meningitis from Acute Purulent Otitis, 474, 513
KNAPP, H., Aural Complications of Influenza, 38

Knife for Hyperplastic Ridges in Pharynx (Scheibe), 376
Koerner, Case of True Cholesteatoma, 323

Labyrinth, in Mumps, 437 ; Ostitis of (Scheibe), 382 ; Pathological Specimen of (Brieger), 377
Lake, Richard, Double Ossiculectomy, 133 ; "International Directory," Notice of, 551
Ledermann, Sinus-Thrombosis, 500
Lewis, R., Temporo-Sphenoidal Abscess, 491

Manasse, Brain Abscess, 328
Mann, Mucocele of Ethmoid, 386
Marple, Mastoiditis with Lid Œdema, 494
Massage in Middle-Ear Diseases (Schwabach), 283
Mastoid, Bandage for, 511 ; Dressing after Operations on the (Whiting), 499 ; Fistula of (Harris), 391 ; Indications for Operations on (Phillips), 505 ; Neuralgia of, 539 ; Non-Operative Cases of Inflammation of the (Bacon), 7 ; One Hundred Operations on the, 214 ; Operations on the, in Constitutional Disease (Barth), 344 ; Series of Seventy-Five Operations on the, 432 ; Skin Flap after Operation on (Pischel), 95
Mastoiditis, Case Simulating, 237, 241 ; Early Operations in (Dench), 156 ; Opening of Sinus in, 40; Skin Grafting after Operations for, 134 ; with Erysipelas (Gruening), 495 ; with Œdema of Eyelids, 494 ; with Paralysis of External Rectus (Pischel), 91
McAuliffe, Eustachian Catheter, 500; Mastoid Bandage, 511
McKernon, Otitic Brain Abscess, 392 ; Syringe, 511 ; Temporo-Sphenoidal Abscess, 235, 240
Meatus, Tumor of External, 138 ; Ulcer of (Kayser), 376
Membrana Tympani, Excrescences of, 526
Meningitis, Otogenous (Cohn), 291 ; (Hinsberg), 96
Middle Ear, Reports on, 57, 167, 405, 526 ; Tumor of (Braislin), 463 ; Use of Microscope in Diagnosticating Diseases of the (Snydacker), 466
Miscellaneous Notes, 178, 555
Monotremata, Ears of, 378
Music, Impairment of Perception for (Alt), 373

Naso-Pharynx, Reports on the, 70, 275, 411, 437, 448, 541, 546
Nervous Apparatus, Reports on, 62, 410
New York Academy of Medicine, Reports of Meetings of Otological Section, 45, 140, 243, 390, 500
New York Otological Society, Reports of Meetings of, 36, 136, 235, 491
Nose, Neoplasms of the, Reports on, 66, 269, 413 ; Technique of Operations on the (Denker), 332 ; Tuberculosis of the, and Eye Diseases, and Treatment of the Former with Lactic Acid (Hinsberg) 352

Obituary : Steinbrügge, Semeleder, Fick, 554
Ossicles, Caries of the (Goercke), 384
Ossiculectomy (Lake), 133
Otitic Brain Abscess (Berens), 36 ; (Manasse), 328 ; (McKernon), 392
Otitic Brain Diseases, Cases, Literature, etc., 531 ; (Witte and Sturm), 482
Otitic Meningitis (A. Knapp), 513
Otitic Pyæmia (Rimini), 326
Otitis Acuta, Discussion on, 45 ; Reports on, 405, 427
Otitis Externa (Bates), 394; (Schmidt), 113
Otitis Externa Diffusa, 511

Otitis Media Purulenta, Complications of, Reports on, 57, 171, 407, 409, 434, 528; Meningitis from Acute (A. Knapp), 474; Treatment of (Ehrenfeld), 387
Otitis Suppurativa, Epileptiform Convulsions in (Bacon), 497
Otology, Reports of Progress in, 57, 164, 264, 398, 518
Ozæna, Reports on, 64, 266, 542

PANSE, Vertigo, 381
Parotid Gland, Enlarged, 238
PASSOW, Healing of Cerebral Abscesses, 1
Pathology, Reports on, 423, 521
PHILLIPS, Anchylosis of Incus and Malleus, 156; Indications for Mastoid Operations, 505; Otitis Media with Cerebellar Abscess, 85
Physiology, Reports on, 398, 420
PISCHEL, Mastoiditis with Lateral Sinus Thrombosis, 93; Skin Flap after Radical Operation, 95; with Paralysis of External Rectus, 91
POLITZER, "Text-Book of Ear Diseases," Notice of, 277
Polypi, Histology of Aural (Bruehl), 334, 377
Pressure-Probe, 538
PREYSING, Otitic Abscess of Temporal Lobe, 25, 127
PYLE, Conservatism in Mastoiditis, 510; One Hundred Mastoid Operations, 214

QUINLAN, Mastoiditis, 495; Tinnitus, 242; Turbinate Operation with Ear Symptoms, 42

Radical Operation, 262
Reports and General Communications, 164, 399, 421
Retro-Pharyngeal Abscess (Kien), 291, 450
RICHARDS, Otitic Cerebellar Abscess, 179
RIMINI, Otitic Pyæmia, 326
ROEPKE, Otitic Abscess of Temporal Lobe, 30
Round Window, Function of the (Frutiger), 181
RUDOLFF, Adenoid Operation with Overhanging Head, 199

SCHEIBE, Labyrinthine Ostitis, 382
SCHMIDT, Otitis Externa, 113
SCHWABACH, Value of Massage of Drumhead, 283
SHEPPARD, Enlarged Parotid Gland, 238; Stricture of Steno's Duct, 238
Sinus, Thrombo-Phlebitis of Longitudinal (Killian), 314
Sinus Thrombosis, after Acute Otitis (Kipp), 497; in Mastoiditis (Brieger), 369; (Gruening), 43, 237; (Jansen), 364; (Ledermann), 500; (Pischel), 93; (Whiting), 136
SNYDACKER, The Microscope in Middle-Ear Suppuration, 466
Soft Palate, Pharynx, and Buccal Cavity, Reports on, 419, 449, 548
SPORLEDER, Ear and Throat Patients in Basel Hospital, 15
Steno's Duct, Stricture of (Sheppard), 238
STERN, Bottle-Tone Series, 375
SWAIN, Tuberculosis of Ear, 230, 250
Symptomatology, Reports on, 165, 265, 400
Syringe (McKernon), 511

Temporal Lobe, Otitic Abscess of (Preysing), 25, 127; (Roepke), 30
Temporo-Sphenoidal Lobe, Abscess of (Adams), 494; (R. Lewis), 491; (McKernon), 235
THOMSON, W. H., Ear Diseases and the General Practitioner, 45
Tinnitus, Cases of, 242, 251
Tones, Investigation of Simultaneous (Dennert), 379; Series of Bottles for Testing (Stern), 375

Tonsil, Calculus of (Kayser), 376; Case of Enlarged, 239
"Transactions of the Otological Society of the United Kingdom," Notice of, 452
TREITEL, Carcinoma of the Ear, 189
Tuberculosis, of Ear (Swain), 230; of Petrous Bone (Brieger), 376
Tumors of the Ear, Reports on, 175
Turbinates, Operation on, with Ear Symptoms (Quinlan), 42
TURNER, LOGAN, The Accessory Sinuses of the Nose, etc., Notice of, 550

United Kingdom, Otological Society of the, Reports of Meetings, 132, 262; Transactions of the, Notice of the, 452

Vapor Apparatus (Berthold), 376
Vertigo, Tympanic, from Eustachian Occlusion (Brandegee), 205; (Panse), 381
Vestibule, Nerve of (Biehl), 379

WERTHEIM, Bilateral Frontal Sinusitis, 387
Whale, Ear of the (Bönninghaus), 379
WHITING, Encephalocele, 39; Mastoid Dressings, 498; Sinus Thrombosis, 136
WILSON, Tumor of External Meatus, 138
WITTE and STURM, Otogenous Diseases of the Brain, Meninges, and Sinuses, 482

NB 786